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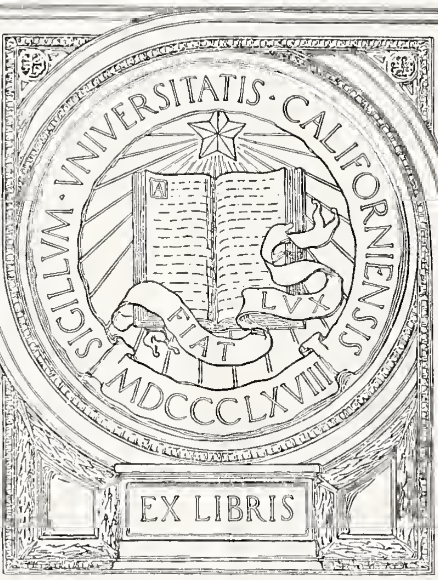

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Connecticut Medicine

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VOLUME 27 JANUARY, 1963 NUMBER 1

John A. Board **Evaluation Of An Immunologic Pregnancy Test**

Hubert Aronson and Rembrandt H. Dunsmore **Ventriculo-Venous Shunt**

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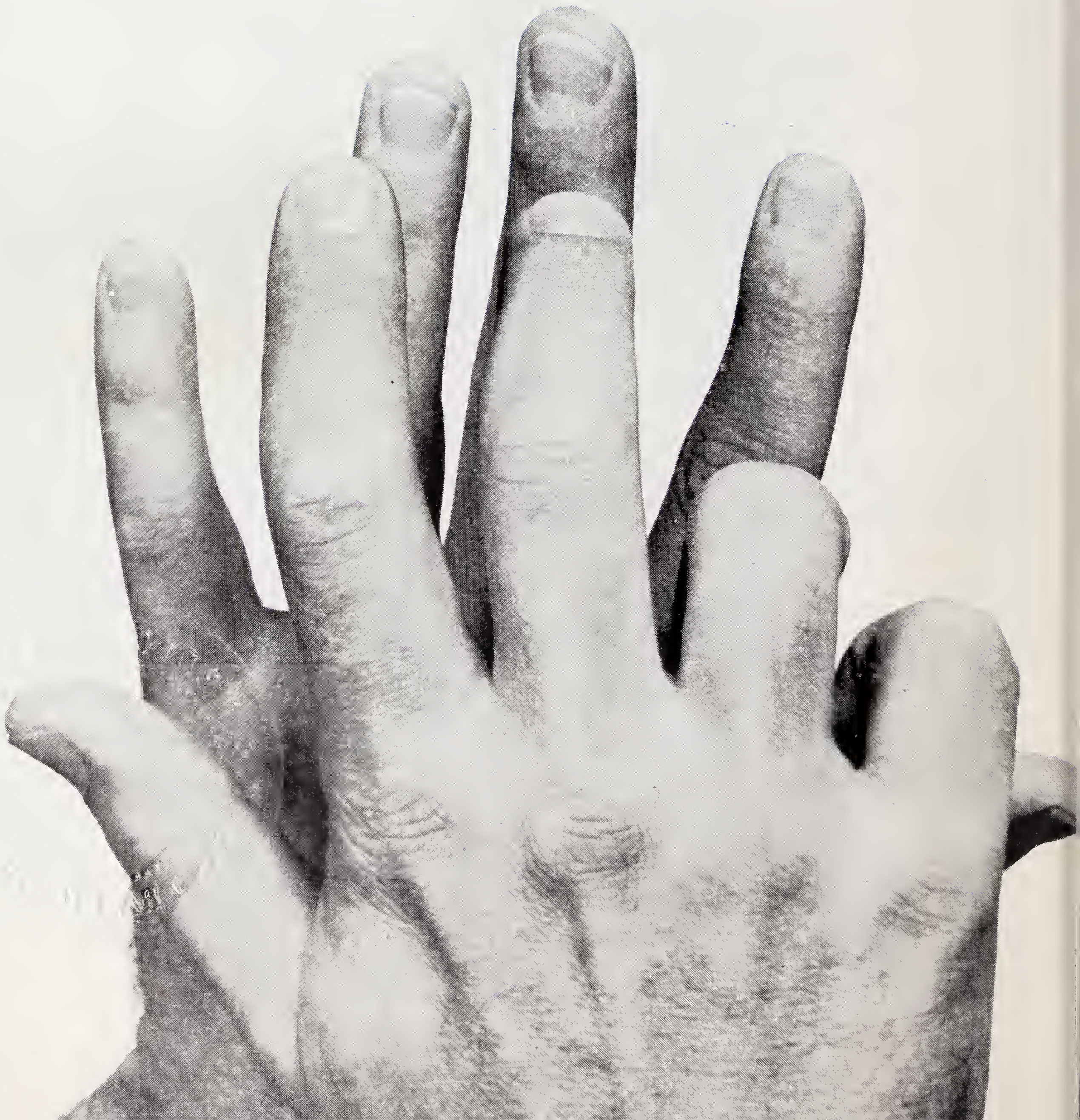

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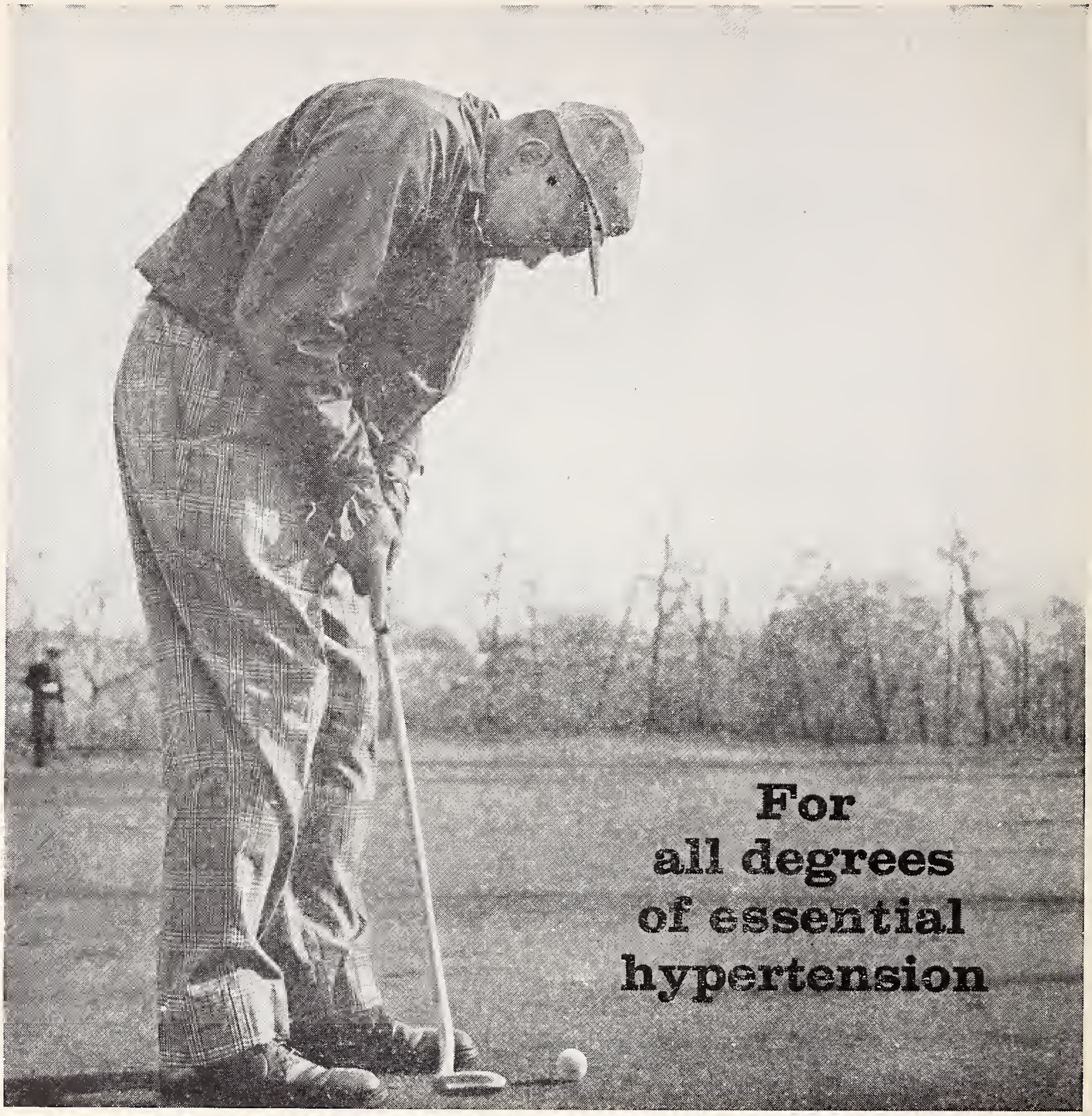

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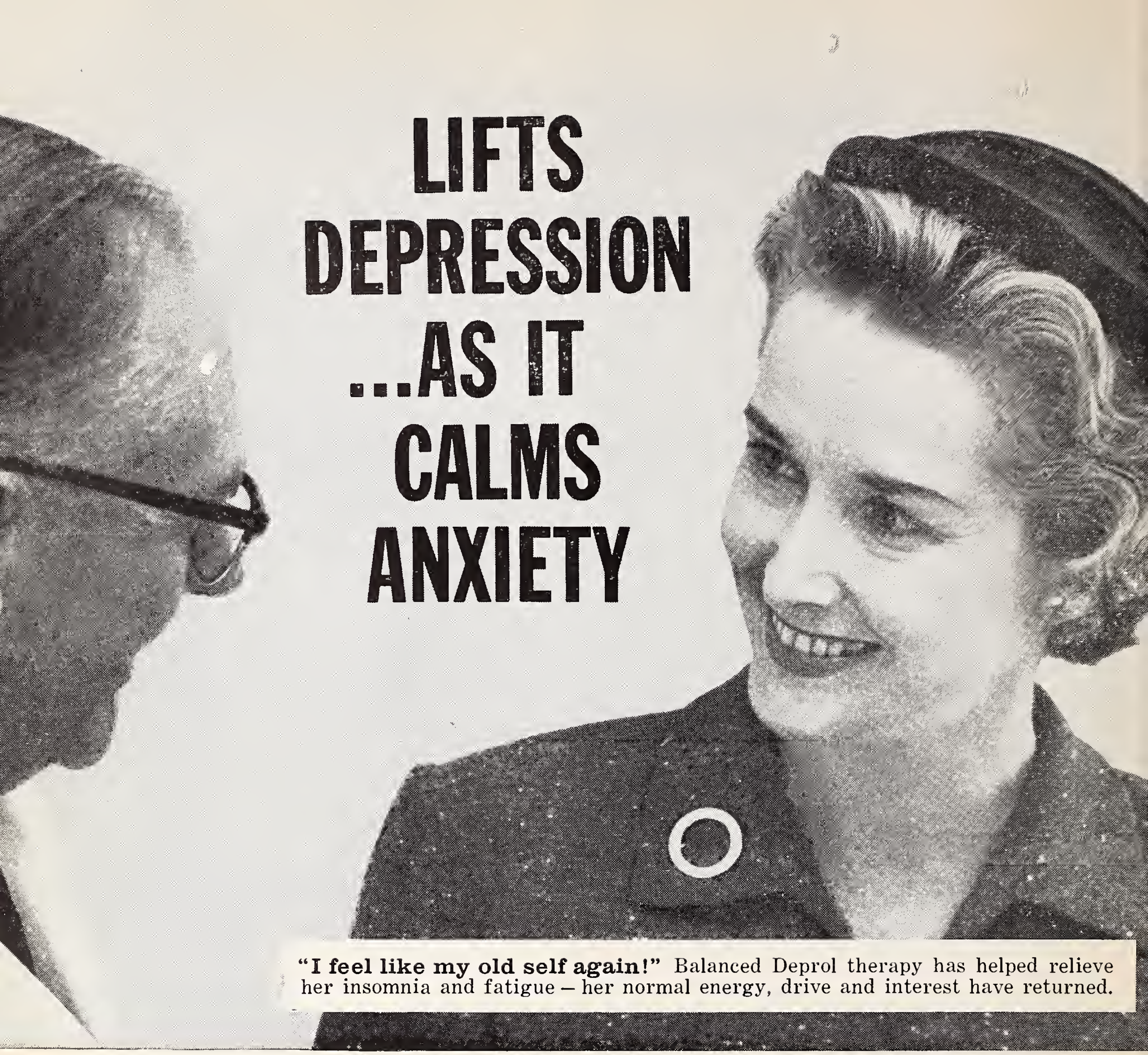

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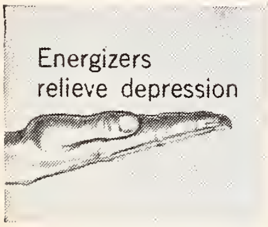

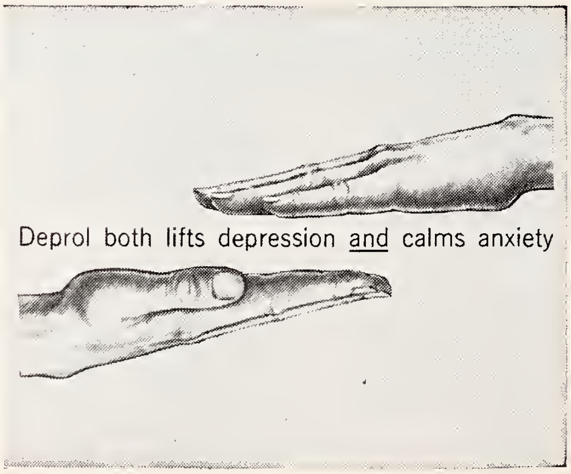
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Evaluation Of An Immunologic Pregnancy Test

JOHN A. BOARD, M.D.
New Haven

IN 1960, Wide and Gemzell[1] described an immunologic method for the assay of human chorionic gonadotropin (HCG) in urine. This could be used as a test for pregnancy and for quantitative determinations of HCG in urine, with results obtainable in 1½ to 2 hours. The present investigation was undertaken to evaluate this method of pregnancy testing.

This procedure was essentially that of Boyden,[2] as modified by Stavitsky.[3] The amount of anti-HCG serum sufficient to cause hemagglutination of tannic acid treated and sensitized red blood cells was determined. This was mixed with the urine to be tested, and if the urine contained an adequate amount of antigen, the antibody was neutralized, thus inhibiting hemagglutination when cells were added.

A very similar method has been used to assay human growth hormone.[4] Wide, Ross and Gemzell[5] have more recently reported that human pituitary luteinizing hormone (LH) inhibited the reaction between anti-HCG serum and HCG sensitized blood cells. With minor changes in technique, such as using more concentrated urine, their method for assay of HCG could be used for assay of LH in the urine of nonpregnant women.

Materials And Methods

All glassware was permitted to soak overnight in a sulfuric acid-sodium dichromate cleaning solution and then was rinsed five times in tap water and twice in distilled water. Reliance upon ordinary washing of equipment in early attempts by us resulted in many false reactions.

Preparation of Antiserum. Ramon's[6] adjuvant was prepared by autoclaving and homogenizing in a sterile Waring blender a mixture of 48 ml. of mineral oil, 24 ml. of saline, and 16 Gm. of lanolin. This was injected with HCG in an effort to hold the hormone as a depot and thus provide a continuous stimulus for the antibody producing mechanism. Rao and Shahani[7] suggested that evidently the antigenicity of HCG was very low, and therefore unless an adjuvant was used, most of the hormone would be promptly eliminated in urine and only a low titer of the antibody would be produced.

Four normal male and female rabbits received six weekly subcutaneous injections of 10,000 to 12,000 I.U. of HCG (A. P. L.) in 3 ml. of diluent plus 2 ml. of Ramon's adjuvant. One week after the last injection, 40 ml. of blood was withdrawn by cardiac puncture, permitted to clot, and centrifuged. The serum was removed, heated at 56° C. for 30 minutes and stored frozen in sterile bottles.

Treatment of Red Blood Cells. Buffered saline at pH 7.2 was prepared by mixing 100 ml. of saline, 77 ml. of 0.15 M. dibasic sodium phosphate (Na_2HPO_4), and 23 ml. of monobasic potassium phosphate (KH_2PO_4). Buffered saline at pH 6.4 was similarly prepared by mixing 100 ml. of saline, 35 ml. of 0.15 M. Na_2HPO_4, and 65 ml. of 0.15 M. KH_2PO_4. All solutions were checked with a pH meter.

Sheep blood in equal parts of Alsever's solution was obtained from Probio, Inc., Nyack, New York. These blood cells were washed three times in saline, and an eight per cent suspension of cells in this was made. Each 6 ml. of this suspension was incubated with 6 ml. of three per cent pH 7 formaldehyde at 37° C. for 19 hours. This made the cells resistant to hemolysis and capable of being stored under refrigeration for at least five to six months.[8] The cells were then washed four times with distilled water and a 10 per cent suspension was made in saline.

Two ml. of this suspension were diluted with saline to obtain a 3.3 per cent concentration and mixed with 6 ml. of freshly prepared 1:40,000 tannic acid in pH 7.2 buffered saline. This was incubated for 30 minutes at 37° C. The tanned for-

---

DR. JOHN A. BOARD was Research Fellow in Obstetrics and Gynecology, Yale University School of Medicine, New Haven. Present address: Department of Obstetrics and Gynecology, Medical College of Virginia, Richmond 19, Virginia.

malinized cells were then washed twice with pH 6.4 buffered saline and a 3.3 per cent suspension in this was made. Freund[9] suggested that tannic acid treatment brought about a change in the surface potential of cells which resulted in their aggregation in the presence of certain electrolytes. Boyden[2] thought the same factors were probably involved in the ability of the acid to promote the adsorption of protein by red cells.

The hormone used for sensitization of the cells was purified by McKean's[10] modification of the ion exchange method of Butt and Round.[11] Amberlite IRA 400 (Cl), a strongly basic anion exchange resin, was washed in N. sodium hydroxide, N. sodium chloride, and distilled water. After the fines were removed, the resin was converted to the borate form by shaking for 10 minutes with a buffer made up to pH 7 by mixing 0.1 M. boric acid and 0.05 M. sodium borate. The buffer was removed and the resin was dried overnight in air. 10,000 I.U. of HCG (A. P. L.) dissolved in 5 ml. of saline was shaken with 0.5 Gm. of the dried resin for 10 minutes and then separated from the resin by filtration.

The filtrate was diluted to 6 ml. with pH 6.4 buffered saline and this was incubated for two hours at 56° C. with 6 ml. of the 3.3 per cent suspension of tanned formalinized sheep red blood cells. The cells were then washed twice in saline and finally prepared as a 2.5 per cent suspension in saline containing 1:100 normal rabbit serum which inhibited spontaneous agglutination of the cells.[2] This suspension was refrigerated until used in hemagglutination tests.

Hemagglutination Reaction. The titer of the antiserum was determined by a hemagglutination reaction. The rabbit antiserum was first prepared in a 1:100 dilution of saline and doubling dilutions to 1:12,000 were made from this. To 0.45 ml. of the diluted antiserum in 12 x 75 mm. glass test tubes was added 0.05 ml. of the 2.5 per cent suspension of sensitized cells. The tubes were individually shaken and permitted to stand at room temperature for three hours.

At the end of this time, the reaction was read and graded according to the pattern of the cells on the bottom of the tubes, using the following criteria of Stavitsky:[3]

++++	compact granular agglutinate
+++	smooth mat on bottom of tube, with folded edges
++	smooth mat on bottom of tube, edges somewhat ragged
+	narrow ring of red around edge of smooth mat
±	smaller area of tube covered than +, and heavier ring around edge
—	discrete red button in center of bottom of tube

The next to last highest dilution which gave a ++ reaction was used for the hemagglutination inhibition reaction.

Hemagglutination Inhibition (Pregnancy Test). Inhibition of the hemagglutination reaction was used as the test for the presence of HCG. Urine was filtered and 1 ml. of the filtrate was diluted to 5 ml. with saline. To each of two 12 x 75 mm. glass test tubes was added 0.25 ml. of the diluted urine. To one tube was added 0.2 ml. of diluted antiserum and to the other was added 0.2 ml. of saline. In each tube was placed 0.05 ml. of sensitized cells. The tubes were shaken and the reaction read in three hours. If sufficient HCG was present, neither tube would show agglutination. If not, the first tube would show at least a 1+ reaction and the second tube would show no agglutination.

Results

The tests were done on voided specimens of urine obtained when women attended the Obstetrics and Gynecology Clinics of Yale Medical Center. The concentration of HCG was therefore probably lower than would be obtained if first morning specimens had been used.[1]

Urine specimens from 100 clinically pregnant patients who were less than 20 weeks from their last menses were examined. We noticed a rise in equivocal or negative tests when the gestation was further advanced than this. Of these 100 examinations, positive pregnancy tests were not obtained in seven instances. Negative results were recorded five times, from women 10, 12, 13, 16 and 16 weeks from their last menses. An equivocal test resulted twice, from women 19 and 14 weeks from their last menses. As the earliest test was done on urine from a woman who was six weeks from her last menses, we were unable to ascertain when in gestation the test first became positive.

Also examined were urine specimens from 100 pre- and postmenopausal women who were not believed to be pregnant or immediately postabortal. Two positive tests for pregnancy were obtained. One specimen was from a 21 year old gravida I, para I woman whose complaint was involuntary infertility for three years. She reported that her last four menstrual cycles had lasted 23 to 24 days instead of her usual 27 to 28 days and that the volume of vaginal bleeding had increased during this time. The test was repeated one week later and was then negative. The other specimen was from a 22 year old gravida O woman whose menses usually occurred every 30 days and lasted five days. She had been treated two months previously for gonorrhea. When the specimen was obtained, she was experiencing the tenth day of vaginal bleeding which had followed amenorrhea of about six weeks duration.

Known concentrations of HCG in distilled water were used in place of urine in order to determine the sensitivity of the method. The lowest concentration which inhibited the hemagglutination reaction was 12,000 I.U. per liter.

Discussion

We found that it was difficult to read the reaction after 1½ to 2 hours as described by Wide and Gemzell, but at three hours the distinction between positive and negative reactions could be more easily made.

For the hemagglutination inhibition tests, Wide and Gemzell used the last highest dilution of antiserum which gave a ++ reaction, instead of the next to last. When this was done by us, we encountered many false pregnant reactions. Since in the method we were following, 0.45 ml. of antiserum was used in the hemagglutination reaction and 0.25 ml. was used in the inhibition reaction, this change was made. Although this eliminated many false pregnant reactions, the change necessitated the presence of more HCG in urine to achieve inhibition.

Our false negative results were probably due to the inability of the method to detect low levels of HCG in urine. Wide and Gemzell stated that a dilution of 200 to 300 I.U. of HCG per liter of urine gave a distinct inhibition of the hemagglutination reaction. In our laboratory, the test was much less sensitive, inhibition occurring at 12,000 I.U. per liter. As done by us, the sensitivity of the test was comparable to the sensitivity (4,000 to 16,000 I.U. per liter, depending on the season) of the male *Rana papiens* biologic test using unconcentrated urine. These concentrations were much higher than necessary for rat hyperemia, mouse, and rabbit tests for pregnancy.[12]

McKean,[10] who described an immunologic pregnancy test using a precipitin testing technique which was read after two hours, reported that the lower limit of sensitivity with his method was not below 8000 I.U. of HCG per liter.

Although the commercial HCG was treated with an ion exchange resin to increase its purity, the cells were not sensitized by a completely pure product. This probably accounted for the false pregnant results; however, one of these may not actually have been false, as the clinical history was compatible with an early abortion.

With the development of further purified preparations of HCG and refinements in technique, it is believed that some form of the reaction of anti-HCG with HCG will eventually replace the biologic methods of HCG assay and testing for pregnancy.

Summary

1. An immunologic test for pregnancy, based on inhibition of anti-HCG serum's hemagglutination reaction with HCG sensitized tannic acid treated red blood cells was studied.
2. Seven of 100 urine specimens from pregnant women less than 20 weeks from their last menses failed to inhibit hemagglutination.
3. Two of 100 urine specimens from nonpregnant women inhibited hemagglutination.
4. In this laboratory, the sensitivity of the test was 12,000 I.U. of HCG per liter.

We wish to acknowledge the guidance and helpful suggestions of Dr. C. L. Buxton, in whose Department this work was done. We also wish to thank Dr. E. P. Isacson for reading the manuscript. Human chorionic gonadotropin (A. P. L.) was supplied through the courtesy of Dr. J. B. Jewell, Ayerst Laboratories, New York, New York.

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Ventriculo-Venous Shunt

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Historical Background

SURGEONS have taken various paths to control the production and absorption of cerebrospinal fluid in the treatment of hydrocephalus. Among the procedures tried have been resection of the choroid plexus, ligation of the carotid arteries to decrease blood flow through the choroid plexus, dehydrating drugs, and direct ventricular puncture.[4] The most recent attempt to control hydrocephalus has aimed at shunting CSF into body cavities, organs, or the circulatory system.

Anastamosing the ventricular system to the vascular system was first widely reported by Payr in 1908.[11] He transplanted valve-containing veins of the parents of hydrocephalic infants, joining the lateral ventricle to the superior longitudinal sinus. Three years later he reported on eight patients upon whom he had operated, but unfortunately he did not state his results.[12] Enderln in the same year reported using the saphenous vein as the channel leading CSF from the ventricle to the dural venous sinus.[5] However, the vein collapsed in the ventricle because of the external pressure on its wall; and, therefore, the method was modified by using the vein as a sleeve over a formalin-fixed calf artery. The anastamosis was then made between the ventricle and the internal jugular vein. At one time Enderln attempted an anastamosis of the ventricle to an enlarged superficial temporal vein using the anterior tibial artery. one of his efforts was wholly successful. McClure, in 1909, anastamosed the subdural space via the cephalic vein of the patient's father to the external jugular vein, but the child died shortly after the operation.[9] Haynes published a series of articles dealing with this problem and in 1915 reported twelve cases treated by the placement of a right-angle, silver canula in the cisterna magna and leading it into the dural sinus.[6] He noted no improvement in the mental or physical condition of his patients. In 1910, Kanavel sutured a superficial vein of the head to the dura with relief of the hydrocephalus for ten days.[8] Beck reported at the same time that six years earlier he had transplanted a "superficial vein of the head into the cavity."[2] He treated a second patient with a shunt to the jugular vein, and the patient did well for six months.

There is a marked paucity of reports dealing with the cause of these early failures in ventriculo-venous shunt. For the most part, only clinical trials were reported. Reports dealing with the fate of these shunts especially over a prolonged period are not available.

The experimental basis for the establishment of ventriculo-venous shunts was established in 1948 with the report of Ingraham *et al.*[7] They ran controlled experiments attempting to shunt CSF from the ventricle into the dural sinus, vena cava, and neck veins of dogs made hydrocephalic by blocking the Aqueduct of Sylvius. Polyethylene tubing was used for the shunt material. Essentially, the results of all the shunts was the same—immediate shunting of CSF into the vascular system was readily accomplished but all the shunts became occluded after a short period of time. They found that, although the ventricular pressure is higher initially, after reducing the pressure via the shunt, blood was able to reflux into the vascular end of the tubing and clot. Their final conclusions were that only by the use of a valve "introduced between the cerebrospinal fluid pathways and the venous system in such a fashion as to permit only uni-directional flow of fluid . . . , all attempts to achieve ventricular decompression by ventriculo-venous shunts will fail . . .".[7]

With the Ingraham work for background, Nulsen and Spitz, in 1952, were the first to report the clinical use of a valve for shunting CSF into the venous system.[10] Their first valve contained a stainless steel ball and could be used as a subcutaneous pump. This valve, now modified as the Spitz-Holter valve, is the one used by the authors. In 1957, Prudenz *et al* described a valve which was located at the venous end of the shunt tubing, going from the ven-

---

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tricle, subcutaneously to the internal jugular vein, via the vein to float in the right auricle.[13, 14] Sikkens, working in France, has reported the use of a two-valve system, similar to the Spitz-Holter valve.[16]

There are very few follow-up reports dealing with the use of uni-directional valves. Nulsen *et al* reported a single patient in his original article who was alive at the end of two and one-half years. Carrington, in 1959, reported his experiences with the Spitz-Holter valve in fifty cases of hydrocephalus.[3] His follow-up period ranged only from two to eighteen months after surgery. Thirty-four of his patients were improved and only three deaths were attributable to surgery. Three patients died of underlying brain disease. He re-operated ten times on eight patients. Pudenz, reporting on personal use with his own valve, claimed that nine of fifteen patients had relief of symptoms four to fourteen months after surgery.[15] Pathological examinations of three patients that died indicated one death was due to malfunction of the shunt and two deaths related to other causes with the shunts still working. Anderson reviewed the results in 36 patients with Pudenz valves and noted twelve deaths on follow-up study.[1] About 50 per cent (17) of the cases were doing well, but the valve failed to control the CSF pressure in 33 per cent (12) of the patients.

TABLE I

	NAME	AGE AT OPERATION		LENGTH OF FOLLOW-UP (MONTHS)
Hydrocephalus—Alive				
(1)	D.B.	1 mo.		38
(2)	J.McC.	3 mos.		24
(3)	V.M.	9 yrs.		24
(4)	M.G.	5 mos.		20
(5)	A.J.	3 mos.		16
(6)	K.L.	5 mos.		15
(7)	F.F.	2 mos.		14
(8)	L.H.	1 mo.		12
(9)	N.T.	4 mos.		12
(10)	T.K.	7 mos.		10
(11)	J.I.	35 yrs.		3
(12)	L.M.	14 yrs.		3
(13)	P.M.	5 mos.		6 weeks
Hydrocephalus—Dead				
(14)	S.B.	10 yrs.		30
(15)	J.L.	1 yr.		28
(16)	G.M.	8 mos.		28
(17)	C.C.	2 yrs. 5 mos.		27
(18)	D.E.	3 mos.		24
(19)	N.V.	2 mos.		15
(20)	M.M.	5 mos.		15
(21)	E.M.	2 yrs. 6 mos.		12
(22)	S.H.	2 yrs. 6 mos.		8
(23)	B.D.	3 mos.		8
(24)	S.M.	7 mos.		3
(25)	C.D.	1 wk.		3
Hydrocephalus—? Alive or Dead				
(26)	D.J.	8 mos.		12
(27)	E.N.	5 mos.		5
Tumors—Alive				
(28)	M.C.	43 yrs.	Astrocytoma	37
(29)	M.O.	49 yrs.	Angioma	12
(30)	J.B.	3 yrs.	Cerebellar tumor	10
(31)	S.T.	48 yrs.	Pontine glioma	2
Tumors—Dead				
(32)	J.M.	55 yrs.	Metastatic carcinoma	12
(33)	M.P.	6 yrs.	Medulloblastoma	5
(34)	W.M.	3 yrs.	Medulloblastoma	3
(35)	B.W.	28 yrs.	Acoustic neuroma	3
(36)	P.K.	54 yrs.	Malignant tumor	1
(37)	G.B.	3 yrs. 9 mos.	Medulloblastoma	1
Tumors—? Alive or Dead				
(38)	G.K.	6 yrs.	Glioma	0

Introduction

A review of the combined cases of the Hartford Hospital and the Grace-New Haven Community Hospital reveals a total of 38 cases in which a ventriculo-venous shunt has been done. A majority of the operations were performed for congenital hydrocephalus. The remainder for the most part were for the relief of obstructive hydrocephalus secondary to neoplasm. Most of the latter cases were malignant tumors and the procedure was palliative only. (Table I)

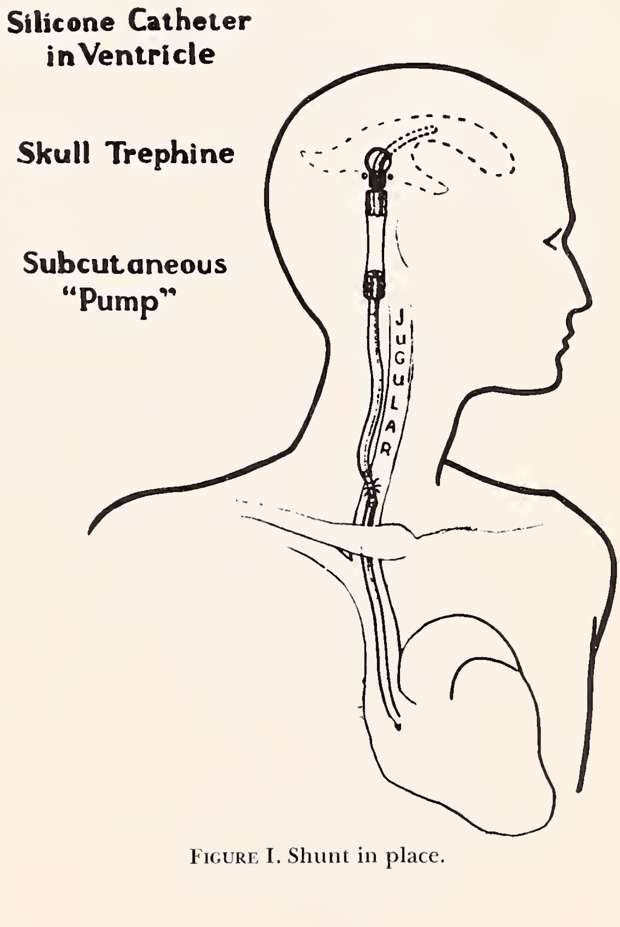

FIGURE I. Shunt in place.

All patients were operated on under general, endotracheal anesthesia. They were placed supine on the table with the head turned toward the left and the neck extended. A small right parietal scalp flap was turned and a burr hole made. Next, through a transverse neck incision the internal jugular vein was isolated. A large clamp was then passed subcutaneously from the burr hole site into the neck wound and the valve with the venous catheter attached was brought to rest subcutaneously over the parieto-mastoid area. A pre-formed right angle catheter was placed into the ventricle and distally attached to the valve. At this juncture CSF could now be seen to come from the venous tubing. The previously isolated internal jugular vein was then opened after a purse string suture had been placed and a cardiac catheter inserted to identify the right auricle-superior vena cava junction. A piece of tubing was then cut the proper distance and attached to the tubing from the distal end of the valve over a dacron connector, so that the end of the tubing was just inside the auricle. All wounds were then closed with silk.

Table II

DIAGNOSIS	NUMBER OF CASES	NUMBER OF CASES REVISED
Hydrocephalus	27	15
Tumors	11	0

Discussion

The treatment of hydrocephalus has become somewhat more encouraging, although there continues to be a distressing need for revision of the primary operation to maintain a functional valve. None of the patients with brain tumors required shunt revisions for as long as they were followed. Fifteen of the twenty-seven patients with hydrocephalus required revisions. Nine patients had one revision, five had two revisions, and one patient had three revisions.

It has been well established that obstruction of the jugular end of the catheter has been the major source of difficulty. (Table III) One cause of this is that, if the jugular end does not pass well into the superior vena cava, thrombus about the distal end ensues. The use of X-ray to estimate the distance from the internal jugular vein into the right auricle has proved to be less reliable than the localization of the auricle by electrocardiography. The latter method has been used exclusively on more recent cases. The growth factor, which is a particular problem in infants, has been responsible for the shortening of the jugular end and can be anticipated by X-ray studies during periods of rapid growth. It now seems advisable to lengthen prophylactically the jugular tube when it rises in the vena cava before thrombosis of the jugular vein occurs. Repair of this complication requires either reaming out of the blocked vein or transferring the tube to the opposite side.

Table III

Causes of Valve Failure

CAUSE	NUMBER
Malfunction of cardiac end	13
Malfunction of ventricular end	2
Malfunction of valve	3*
Infections	3
Death	1

* All three revisions for valve malfunction performed on one patient.

Septicemia due to inadequate sterilization, faulty surgical technique, or irritation of the myocardium continues to be a problem. The three patients who developed septicemia required removal of the valve to control the infection. Reinsertion of the valve at a later date was successful in all three patients. The two cases in which the ventricular end performed improperly were technical errors due to disjoining of the catheter from the valve. One patient required a new valve and had three operations. The correct pressure valve was finally used satisfactorily. In each case the pressure in the valve had been too high. The one operative death was in a patient early in the series, and in this particular case the death may have been due to too rapid decompression of the ventricular system.

Thirteen patients of the twenty-seven operated upon for hydrocephalus are still alive. One patient has been lost to follow-up. Ten of the remaining patients are normal as far as their cerebral function is concerned, but several have major neurological deficits secondary to an associated myelomeningocele. These deficits include paraplegia, fecal and urinary incontinence, and deformities of the spine and lower limbs.

The fourteen patients who died all had evidence of severe neurological deficit. A few of the fatalities demonstrated at post mortem examination such gross malformation of the brain as to make it most unlikely that normal mental develoment could have been anticipated.

A significant number of children can outgrow the hydrocephalus or at least the necessity for shunting. In these cases the valve serves as a temporary measure to tide the patients over this critical phase of the hydrocephalus. There is no method at present which permits identification of these children, but it can be anticipated that normal development will take place in some children in spite of blockage of the valve. The use of the valve in tumor cases has proven very satisfactory in tiding the patients over severe bouts of increased intracranial pressure. However, it, of course, offers no solution to the treatment of the underlying brain tumor itself and cannot be expected to influence the tumor growth. Its use in these patients, however, has proven very gratifying in relieving the symptoms of increased intracranial pressure.

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Nature is nowhere accustomed more openly to display her secret mysteries than in cases where she shows traces of her workings apart from the beaten path; nor is there any better way to advance the proper practice of medicine than to give our minds to the discovery of the usual law of nature by careful investigation of cases of rarer forms of disease. For it has been found, in almost all things that what they contain of useful or applicable nature is hardly perceived unless we are deprived of them, or they become deranged in some way.

—William Harvey, 1657

Hypertension And Increased Aldosterone Excretion Associated With Unilateral Renal Artery Stenosis

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EXPERIMENTAL evidence indicates that the kidney via the renin-angiotensin system plays an important role in the regulation of aldosterone secretion.[1,2] Several patients with hypertension due to renal artery disease have been reported with hyperaldosteronism.[3,4,5] The present report describes a patient with hypertension and increased aldosterone excretion with unilateral renal artery stenosis. Both the hypertension and the high aldosterone excretion returned to normal following nephrectomy.

Case Report

A 41-year-old married woman was first admitted to the West Haven Veterans Hospital on September 6, 1960, with a chief complaint of high blood pressure. She had enjoyed good health all her life until six months before admission when she noted marked fatigue, frequent ankle swellings and occasional palpitations. During the three months prior to admission morning headaches and decreased visual acuity had been troublesome. When an elevated blood pressure was noted by her private physician she was immediately hospitalized.

Prior to her present illness, frequent physical examinations had found her to be normotensive, except for the last blood pressure recorded in 1958 which was 135/90 mm. Hg. There was no history of urinary tract infection, abdominal pain, hematuria or renal disease.

Both parents were known to be hypertensive. One brother was alive and well.

Physical examination revealed a blood pressure of 210/115 mm. Hg in both arms, a regular pulse of 90, respiratory rate of 14 and normal temperature. There was Grade II retinopathy, with arteriolar narrowing. The remainder of the physical examination was within normal limits.

Initial laboratory investigation revealed a normal hemogram; BUN 12.5 mg%; FBS 98 mg%; CO_2 26, Na 140, Cl 102, K 4.9; creatinine 1.05 mg%; liver function tests were normal; serum protein values were normal; several urine analyses showed a pH both acidic and basic; specific gravity 1.005 to 1.028, albumin zero to trace, sediment with 0-3 WBC and 0-2 RBC per HPF.

Chest x-ray showed a normal cardiac silhouette and lungs. EKG was within normal limits. Intravenous pyelogram was normal. Two regitine tests were equivocally positive but urinary catecholamine levels were repeatedly normal. Urine culture was negative.

The Differential Renal Excretion Test (Table I) revealed a marked decrease in urine volume and sodium excretion from the left kidney. Lumbar aortogram showed a localized constriction of the left renal artery, just distal to its origin, with post stenotic dilatation. Pre- and pos-operative urinary function studies and urinary aldosterone levels are shown in Table II. Of special interest is the high urinary aldosterone preoperatively even though the patient was on a normal salt diet and not receiving diuretics. Urinary aldosterone returned to normal postoperatively.

TABLE I
DIFFERENTIAL RENAL FUNCTION TEST

	RIGHT KIDNEY	LEFT KIDNEY
Volume cc/20 minutes	82	23
Na meq/L	22	6
Creatinine mg%	6.7	25.0
mosm/L	84	92

The values expressed are the average of three consecutive collection periods. There was no leakage of urine into the bladder.

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Table II

Aldosterone Excretion and Renal Function, Pre- and Post-operative

	PRE-OPERATIVE	POST-OPERATIVE
BUN	12.5 mg%	16.0 mg%
Serum Creatinine	1.05 mg%	1.20 mg%
Creatinine Clearance	63.8 cc/min.	65.1 cc/min.
PSP-15 minute excretion	26.5%	17.0%
Aldosterone 24-hour excretion (normal 2-18 μg)	32 μg	6, 8 μg

Renal function studies and 24-hour urinary aldosterone excretion.

Hospital Course

The initial hospital course was characterized by an elevated and markedly labile blood pressure, in the range of 210/110 to 280/160 mm. Hg. Antihypertensive therapy with diuril and Apresoline was marked by labile hypertension and moderately severe episodes of orthostatic hypotension.

On 11/2/60 an exploration of the left renal artery was performed. An area of narrowing in the proximal third, due to sub-intimal proliferation, was found. Correction was attempted with a Teflon patch graft. The blood pressure fell briefly in the immediate postoperative period, but rose on the second and third days to the previous hypertensive levels. A transient rise in serum transaminase and fever post-operatively, suggested infarction of the left kidney. An IVP on November 7, 1960, showed non-functioning on the left side. Accordingly, on December 17, 1960, the patient was again explored and a small left kidney encased in an indurated, fibrotic capsule of fat, with a thrombosed renal artery was found. The kidney was excised.

Immediately post-operative, her blood pressure fell to normotensive levels and her course was benign and uneventful. There was a rapid gain of a sense of well being. During the six month follow-up period her blood pressure has remained in the range of 100-130/70-80 mm. Hg.

Discussion

During the last several years, there has been a renewed interest in the development of diagnostic techniques for the evaluation of various types of hypertension. Particular interest has been focused on the diagnosis of unilateral renal artery lesions because they represent a potentially curable form of hypertension. The exact incidence of this lesion is not known, but it appears that, with greater awareness, it is being recognized with greater frequency. Revell, *et al*[6] have recently emphasized the inadequacies of our current diagnostic tests for screening patients with hypertension for the presence of unilateral renal vascular disease. Of equal difficulty is the selection of those patients who are most likely to respond to surgical therapy.

The present case illustrates a patient with the recent onset of significant hypertension. Differential renal function tests and translumbar aortography demonstrated unilateral renal artery insufficiency. This was confirmed by surgical exploration. The hypertension was relieved by nephrectomy and the blood pressure has remained normal during a six-month follow-up period. Of special interest was the preoperative finding of increased urinary aldosterone which became normal following nephrectomy. Despite the increased aldosterone excretion, serum electrolytes were normal. Other cases[4,5,6] have been reported of hypertension caused by renal artery lesions which were associated with increased aldosterone excretion. Frequently the clinical features of Conn's Syndrome have been present. The hypertension in these cases responded to surgical correction of the renal vascular lesions. Laragh mentioned two patients he has studied[7] with hypersecretion of aldosterone and related renal disease. Following nephrectomy, the clinical picture improved and aldosterone secretion was reduced.

The mechanism for the elevated aldosterone production in renal artery stenosis is still somewhat speculative. However, there is some recent experimental evidence upon which we can construct a reasonable hypothesis. Constriction of the renal artery will cause a release of renin by the kidney[8] which acts on alpha-2-globulin in the blood to form angiotensin I. A specific converting enzyme in plasma converts angiotensin I into the potent pressor octapeptide, angiotensin II. It has recently been shown[2,9,10] that angiotensin II is not only a potent vasopressor but can also stimulate the adrenal production of aldosterone. This, then, may be the mechanism operating to produce secondary hyperaldosteronism in patients with hypertension due to renal artery disease. It seems likely to us that the production of hypokalemic alkalosis is not a necessary part of the clinical picture; it is perhaps in part a quantitative change and may be altered to some extent by diet and the duration of the hyperaldosteronism.

In evaluating the aldosterone output in these patients, attention should be paid to diet and drug therapy, since sodium and potassium depletion can alter aldosterone secretion. The uniformly good surgical results in patients with this form of renal hypertension and hyperaldosteronism suggests that the finding of elevated aldosterone excretion may be an additional good prognostic sign for selecting patients for nephrectomy or renal artery repair. It is a possibility, however, that prolonged hypertension may cause significant vascular changes in the opposite kidney to produce a "renin" mechanism which would not be relieved by correction of the initial lesion. Only future studies will determine the value of aldosterone measurement in patients with hypertension from unilateral renal disease.

Summary

The clinical history of a 41-year-old woman with hypertension due to stenosis of the left renal artery is presented. A high aldosterone excretion, and normal serum electrolytes were also found. Both the hypertension and hyperaldosteronism returned to normal following nephrectomy.

The mechanism of production of hyperaldosteronism due to renal ischemia is discussed. The possible usefulness of this finding in the selection of patients with renal hypertension for surgical repair is suggested.

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Research is a gamble. *It cannot be conducted according to the rules of efficiency engineering. Research must be lavish of ideas, money, and time.*

The best advice is don't quit easily, don't trust anyone's judgment but your own, especially, don't take any advice from any commercial person or financial expert, and finally, if you really don't know what to do, match for it. The best person to decide what research work shall be done is the man who is doing research. The next best is the head of the department. After that you leave the field of best persons and meet increasingly worse groups.

The first of these is the research director who is probably wrong more than half the time. Then comes a committee which is wrong most of the time. Finally there is the committee of vice-presidents which is wrong all the time.

—C. E. K. Mees, Director of Research, Eastman Kodak Company

Pulsating Metastasis Of Bone From Hypernephroma

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THIS case report and literature review emphasizes the diagnostic findings and therapy in pulsating metastases of bone from hypernephroma.

Case Report

A.D. (N.B.G.H. 284,981), a 67 year old white male, was well until eight months prior to admission when he noted pain, aggravated by walking, in the anterior aspect of both knees. He also complained of pain in both calves with radiation up the posterolateral aspect of both thighs to the mid low back. This pain occurred after walking several feet and disappeared upon resting. There was no history of leg pain at night.

He had anorexia for several months associated with a twenty pound weight loss. Review of systems was negative except for mild nocturia. There was no history of dysuria, hematuria, pyuria, flank or costovertebral angle pain.

Physical examination revealed a well developed, thin, white male with evidence of recent weight loss. Vital signs were normal. The skin showed poor turgor and moderate generalized pallor. There was cyanosis of the nail beds. There were bilateral cataracts and pale conjunctivae. The neck was supple. There was no distention of the neck veins, no lymphadenopathy, and the thyroid gland was not palpable. There was an increased anterior-posterior diameter of the chest and decreased diaphragmatic excursions. The lungs were hyperresonant and expiratory wheezes were audible bilaterally. The point of maximal impulse and the left cardiac border were within normal limits. There was a regular sinus rhythm and the heart sounds were of good quality. No thrills nor murmurs were heard. There was no vertebral nor costovertebral angle tenderness. The abdomen was soft, The liver, spleen, and kidneys were not palpable. He had clubbing of his extremities, cyanosis of the nail beds, bilateral varicose veins, and slight ankle edema. The dorsalis pedis pulses were absent and both feet were relatively cool. Rectal examination revealed the prostate gland to be slightly enlarged, firm, smooth, and non-tender. There were no rectal mucosal abnormalities. The remainder of the examination was within normal limits.

Laboratory examination revealed a red blood cell count of 2.3 million and a hemaglobin of 6.0 grams. The hematocrit was 22 per cent. Blood indices showed a mean corpuscular volume of 98 u^3, a mean corpuscular hemoglobulin of 26 uug, and a mean corpuscular hemoglobulin concentration of 27 grams per 100 cc. The serum iron was 15 micrograms percent. Admission urinalysis showed albuminuria of 5 mgms per cent and 15-30 red blood cells per low power field. Two other urinalyses, obtained on the second and fourth hospital days, were within normal limits. The white cell count was 14,800 with 85 neutrophils, 10 lymphocytes, and 5 monocytes. Several stool guaiacs were negative. The alkaline phosphatase was 5.5 Bodansky units. The acid phosphatase was 0.6 Bessey-Lowry units. The serum calcium was 5.3 meq. per liter. Total proteins were 5.8 grams with 2.2 grams albumin and 3.6 grams globulin. The cephalin flocculation, thymol turbidity, total cholesterol and esters, and serum bilirubin were within normal limits. There was a bromsulfthalein retention of 21 per cent. Chest x-ray revealed normal heart and lungs and recent fractures of the fourth and fifth anterior ribs.

Proctoscopy, Barium Enema, and G-I Series were normal. The intravenous pyelogram showed normal kidney function in addition to osteoarthritic changes of the lumbar spine.

Five days after admission the patient complained of pain in the right knee; it was hot, tender, and swollen. X-ray revealed an osteolytic defect below the lateral plateau in the tibia, consisting of destruction of the cortex and calcification extending into the soft tissue (Fig. 1). Metastatic series was

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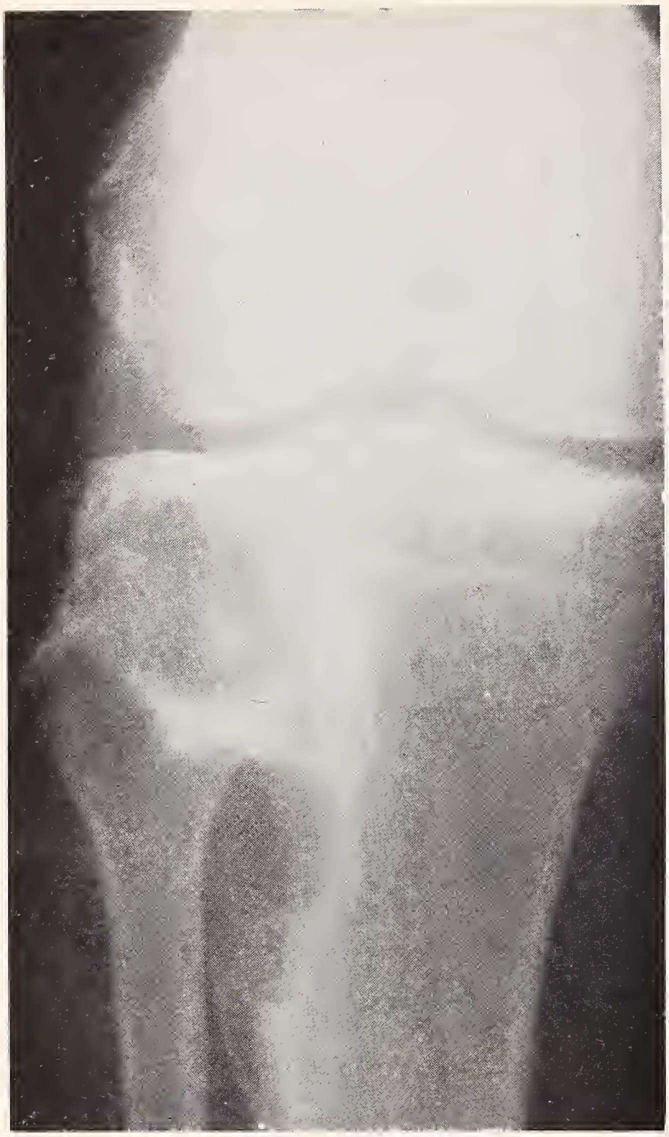

Figure I

Roentgenogram of right tibia showing the osteolytic lesion.

negative. A repeat urinalysis, on the fifth hospital day, showed 20-25 red blood cells per high power field. The patient's clinical course otherwise remained unremarkable except for a fever between 99.0° F. and 101.5° F.

The combination of microscopic hematuria and a lytic lesion in bone suggested the possibility of a hypernephroma. Upon re-examination of the right knee, a pulsatile mass was palpated and a systolic bruit was heard. The pulsation and bruit were systolic in timing and were obliterated by compression of the femoral artery. There was a negative Branham's sign.

Diodrast injection into the femoral artery revealed immediate opacification in the region of the osteolytic lesion with extension of dye into the soft tissue (Fig. 2). There was prompt clearing of the dye from this area.

Retrograde pyelograms of the left kidney showed narrowing of the infundibular portion of the superior calyx and hydrocalyces in this area with displacement of the adjacent caylx. The right kidney was normal.

An open biopsy was performed on the superficial aspect of the pulsatile lesion of the right knee. Microscopic examination of this specimen revealed typical "clear cells" of hypernephroma (Fig. 3).

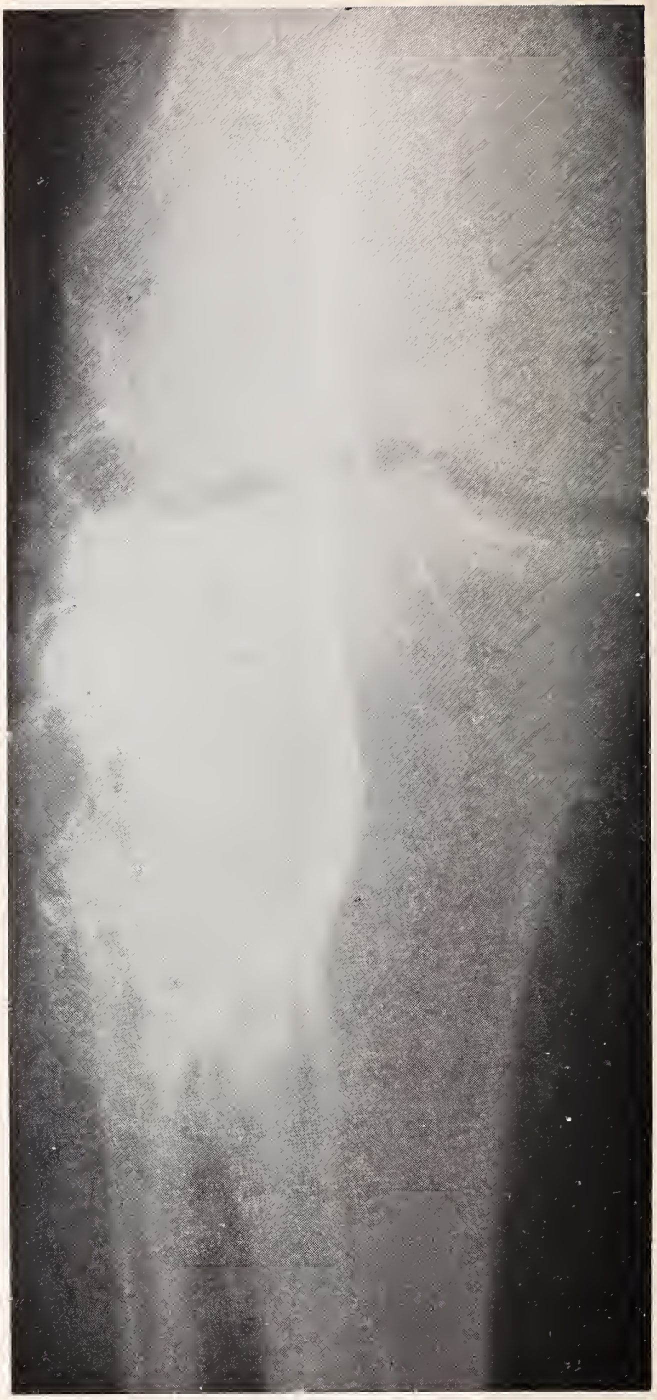

Figure II

Demonstration of marked opacification of metastatic site with Diodrast.

The patient was treated with blood transfusions and then, under general endotracheal anesthesia, a left nephrectomy was performed. A large left renal tumor was found and two large aortic nodes were excised. Microscopic study of the left kidney showed a clear cell adenocarcinoma (Fig. 4), well differentiated, with invasion of small blood vessels and metastases to each of the two lymph nodes. There was no invasion of the renal vein.

Postoperatively, circulatory collapse and anuria occurred. There was no obvious external blood loss. The blood pressure

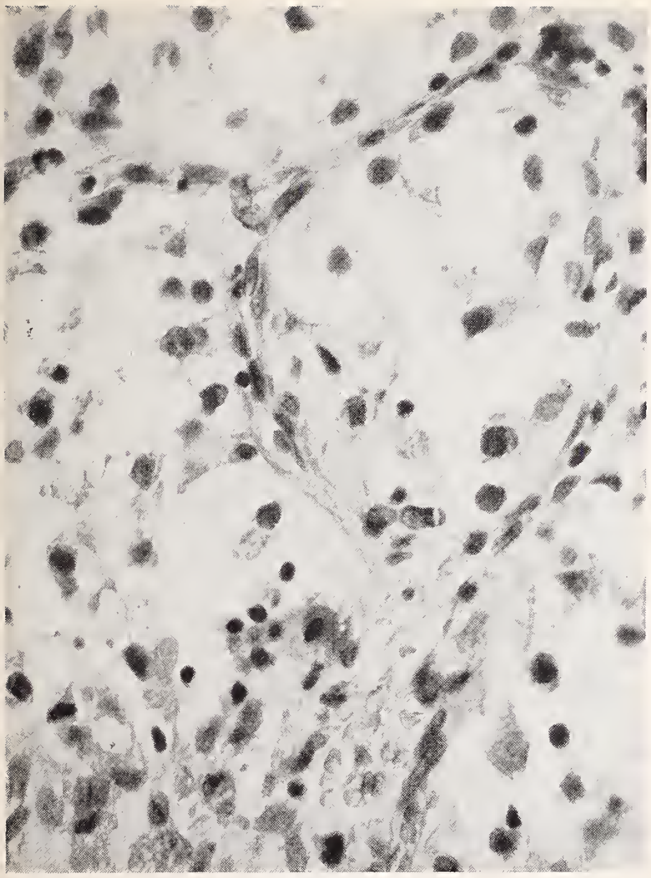

Figure III

High power photomicrograph of biopsy specimen of metastasis to right tibia, hematoxylin and eosin; magnification x 468.

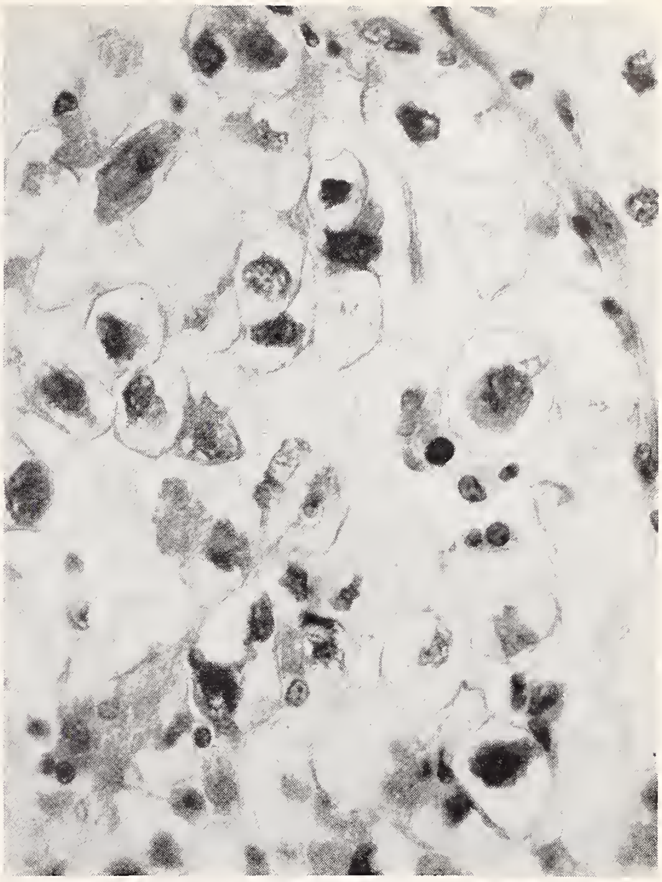

Figure IV

High power photomicrograph of left kidney showing clear cell adenocarcinoma; hematoxylin and eosin; magnification x 468.

finally responded well to metaraminol bitartrate, whole blood, and steroids, and the urinary output returned to normal levels after twenty-two hours. However, circulatory collapse recurred twelve days postoperatively and the patient expired despite supportive therapy.

Autopsy by Dr. H. Truax, revealed: 1. Partially differentiated adenocarcinoma, clear cell type with metastasis to regional lymph nodes, bone (right tibia), tail of pancreas, and liver. 2. Ruptured spleen with retroperitoneal bleeding.

Discussion

Pulsating bone lesions are rare. The first recorded case of a pulsating metastatic lesion of bone secondary to hypernephroma was mentioned by von Bergman in 1887.[1] Since then, ours is the twenty-sixth additional case to be recorded.[2–15] Pulsating metastases of bone secondary to thyroid carcinoma occur with equal frequency as those from hypernephroma. Crile,[9] in 1939, reporting on pulsating neoplasms of the sternum, mentioned five cases each from thyroid and renal carcinoma, and five more cases of his own; four of which were from the thyroid. There have only been seven cases of pulsatile giant cell tumors of bone[16, 17] and five cases of pulsatile primary hemangiomas[18, 19, 20] reported thus far.

The finding of a systolic pulsatile mass over bone, associated with a systolic bruit, both of which are obliterated by compression of the arterial supply, confirms the vascularity of such a lesion. A negative Branham's sign rules out an arteriovenous fistula. Arteriography aids in distinguishing between a true aneurysm and a pulsating tumor of bone.

Osteolytic metastatic lesions usually arise from carcinoma of the breast, lung, prostate, kidney, or thyroid. However, the presence of a pulsation or bruit at the site of the lesion limits the diagnostic possibilities to either the kidney, the thyroid, or the much rarer pulsatile primary bone tumors. Therefore, in the absence of a palpable or substernal thyroid gland, a careful urological survey is indicated.

The location of the bone metastasis is of no help in the differential diagnosis. Cases of hypernephroma have been reported with metastasis to the sternum,[9] clavicle,[11] femur,[14] scapula[29] humerus,[30] skull,[13] spine,[6] tibia,[12] mandible,[21] and even to the nasal septum.[22] Biopsy of these lesions have the hazard of bleeding and the difficulty of diagnosis from the small portion of tumor tissue. An erroneous diagnosis of endothelioma may be made.

Our patient did not present with the classic triad of hypernephroma, which consists of hematuria, flank pain, and a palpable mass in the flank. The findings of these manifestations together comes late in the course of the disease. In fact, all three may be absent; the patient may have no findings referable to the genito-urinary tract. Our case presented with intermittent microscopic hematuria, anemia, a low grade fever, and bone pain. An anemia of less than ten grams of hemoglobin was found in 28 per cent of two hundred and seventy-three cases of hypernephroma by Berger and Sinkoff.[23] Forty-four per cent of their cases revealed no evidence of even microscopic bleeding from the urinary tract. The occurrence of an anemia in this disease is especially interesting in view of the fact that there may not be evident urinary bleeding or bone marrow invasion to explain its cause. Polycythemia occurred in 4.6 per cent of the three hundred and fifty cases of hypernephroma reported by Damon, Holub, Melicon, and Uson.[24] Berger and Sinkoff[23] reported the occurrence of fever in 16 per cent of their patients; it was the chief complaint in 2.5 per cent of cases.

Hypernephroma has a tendency to solitary metastasis, but may spread widely and to obscure sites. Nephrectomy is definitely worth a trial in the hope that involution of the metastasis may occur. However, this is rarely achieved. The lung is the most common site in which there has been spontaneous disappearance of metastasis following nephrectomy.[26,27,28] There have been several instances of long term survival or cure following nephrectomy plus removal of solitary metastasis by excision and amputation.[4,29,30,31,32] Such an approach seems reasonable in an attempt for cure. Further long term evaluation is necessary, however, as some patients survive for long periods of time without treatment. There have also been varying reports as to the effectiveness of nephrectomy followed by radiation to the kidney aera and to the metastatic site.[33,34,35] The consensus of opinion is that the latter therapy is worthy of further trial and will at least afford relief of pain.[25,36,37]

Summary

A case of a pulsating bone lesion from hypernephroma is presented with a review of the literature. The presence of anemia, low grade fever, and microscopic hematuria supported the clinical suspicion of a carcinoma of the kidney as the primary site. The difficulty of treatment in the presence of a metastatic lesion is discussed.

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> *How many seeds of great discoveries mentioned as curiosities of little moment we find today in the works of the ancients and even in those of the wise men of the Renaissance. Lost in the pages of a disordered theological treatise (Christianismi Restitutis) are three lines written by Servetus, as though in disdain, referring to the pulmonary circulation, which constitute today his principle deed of glory. . . . His laborious metaphysical disquisitions totally forgotten and instead a fact extolled to which he bestowed no more interest than that accorded an argumentative tool for his thesis that the soul resides in the blood!*
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> —Ramon Y. Cajal, *Precepts And Counsels On Scientific Investigation*

How Can We Change Attitudes And Action On Smoking?

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This paper is limited to a discussion of the role of education as a useful process for influencing attitudes of teenagers toward cigarette smoking. In the space allocated only a very cursory examination of this problem is possible, and those seeking more expansive understanding of the problem are urged to examine at their leisure the many studies and programs reported in the literature.

To avoid misunderstanding, education as used in this paper may be defined as the learning process by which an individual orients, informs, and girds himself for intelligent action. Positive health education is the educational procedure by which individuals are able to assess the social, psychological, cultural, and physical forces which influence health status, and through intelligent understanding, to determine the behavior which is prerequisite to achieving optimum health. Thus, it is important for the educator to understand the forces patterning the behavior of individuals and communities and to use this information in the development of educational programs. The educator seeks to involve individuals and groups actively in learning experiences which will enable them to grow in their understanding and in their ability to cope with personal and community health problems. The educator is concerned with action programs, and he is dependent upon many professions for information which is basic to the development of sound educational programs.

What images do we have of tobacco and teenage smoking?

Tobacco is a major industry in North Carolina, and if this industry were destroyed, I suspect the total economy of the state would collapse. The result of such a disaster would, for a time, probably be substantially more serious to the people of North Carolina than would the problems generally associated with the use of tobacco. Tobacco is an important commodity to many people and, for personal reasons, they will be reluctant to support the indictment that has been leveled at tobacco. This product is probably as dear to the hearts of Americans as are hot dogs and Cokes, and efforts to alter behavior which is associated with the pleasures derived from its use are not easy. There is no "pat" solution for changing attitudes and actions on smoking, and when the practice of smoking is an established behavior pattern, the situation becomes even more complex.

Through education, we hope individuals will acquire an understanding of the nature of the problem and be able to arrive at an intelligent decision regarding their own personal attitudes and practices toward the use of tobacco. Opportunities for achieving this understanding are many, and responsibility for initiating educational activities rests with many individuals and groups.

What information is available to help us grasp more fully the nature of this problem? Many studies have been conducted and much pertinent information is available in the literature, some of which is reviewed here briefly.

1. The weight of evidence implicates smoking as the principal etiological factor in the increased incidence of lung cancer.
2. Cigarette smoking particularly is associated with an increased chance of developing lung cancer.
3. Stopping cigarette smoking, even after long exposure, is beneficial.
4. No method of treating tobacco or filtering the smoke has been demonstrated to be effective in materially reducing or eliminating the hazard of lung cancer.

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5. The nonsmoker has a lower incidence of lung cancer than the smoker in all controlled studies, whether analyzed in terms of rural areas, urban regions, industrial occupations, or sex.

6. Persons who have never smoked at all (cigarettes, cigars, or pipes) have the best chance of escaping lung cancer.

7. Unless the use of tobacco can be made safe, the individual person's risk of lung cancer can best be reduced by the elimination of smoking.[1]

8. The teenage group represents one of the most fruitful opportunities for education of nonsmokers, and if they can be counseled with success never to take up the habit, this would constitute a significant contribution to the prolongation of life and improvement in well-being of adults in the next generation.

9. According to the U.S. Census, by far the largest number of new smokers initiate the habit at 16 or 17 years of age.

10. Factors contributing to starting smoking are many and complex, with at least three considered by authorities as being most significant: (1) identification with smoking parents, (2) adolescent maturity strivings, and (3) the reactivation of infantile needs stirred up by the stress of adolescence.[2]

11. The proportion of fathers who are regular smokers increases and the proportion who are nonsmokers decreases consistently and substantially with decreasing social class.[3]

12. Once the habit is adopted, a greater physiological and psychological complexity develops and the habit continues independent of the original motive.

13. The more firmly convinced an individual is of the ill effects of heavy smoking, the more likely he is to be a nonsmoker, and the more likely he is to quit if he is currently smoking. Other factors suggested are the following:

  a. The longer the individual was breast fed the greater was the likelihood that he would be able to quit.
  b. Marital status is also related to the ease of giving up the habit: married persons seem to have more success than those never married.
  c. The higher one is up the vocational ladder the greater is the quitting rate.[2]

14. Smoking is accepted by the family as a normal and expected form of behavior, and smoking by younger members of the family is part of growing up. Social approval is emphasized by tobacco advertisements.

15. Smoking is high among those who have fallen behind their age-equals in school, do not participate in extracurricular activities, and are taking the scholastically less demanding course of school work. This group, a minority in the school population, has not achieved satisfaction from its peer-group relationships.[4]

16. The proportion of smoking students is much higher in urban areas than in rural areas.

17. Students of both sexes begin experimenting with smoking before, during, and after the seventh grade, and from one study it is suggested that one of every three high school students is a regular smoker,[4,5] while another suggests the ratio is at least 50 per cent.

18. Parental prohibition of smoking among girls results in more smoking than does strong disapproval on the part of parents.

19. Teenagers seem to react positively to a direct, unemotional, intelligent approach which enables them to sift the facts and reach their own conclusion about smoking.[5]

Of these points, several might be singled out here as highly significant guidelines for the educator:

1. A very high percentage of teenagers begin to smoke by age 16 or 17 and efforts to influence smoking practices must occur before this age.

2. Teen age nonsmokers constitute a high priority group for primary prevention efforts. It should be remembered that it is more difficult to alter behavior once the habit is adopted.

3. Adolescent maturity strivings are significant factors contributing to starting smoking, thus signalling the need to seek alternate substitute status symbols for this age.

4. There is need to alter the family concept that smoking is a part of growing up and is a normal and expected form of behavior among younger members.

5. The incidence of smoking among teenagers is highest in children whose parents smoke. An educational program should be directed to adults to acquaint them with the effect of adult smoking practices on youth.

6. Children who are unable to satisfy basic social-psychological needs and in whom the incidence of smoking is high should be given particular attention by teachers.

7. Educational programs should be designed to assist the individual to convince himself of the ill effects of heavy smoking.

8. Community groups should jointly seek ways of counteracting the social approval of smoking emphasized in tobacco advertising.

An essential step in developing a community program would be to encourage all interested organizations, especially the medical and public health professions, to take a public stand on the dangers of cigarette smoking and the need for teen age educational programs. In Massachusetts, 93 per cent of some 4500 physicians stated "teenagers should be informed of the potential dangers of smoking cigarettes as an avenue that may lead to lung cancer in later years."[6] In another state, the physicians on the board of the state cancer society refused to endorse such a statement. The public accepts the authority of the medical profession, and failure of this group to take a specific stand makes the task more difficult for those seeking to encourage development of educational programs.

The Public Health Service statement of the hazards of cigarette smoking is straightforward and should also be endorsed by state and local public health authorities.

Recently, I asked a group of public health administrators if they agreed that teen age smoking is a major public health problem. In spite of the fact that there was unanimous agreement that this is a public health problem, not one single administrator had done anything about it in his community.

We need public support from medical and public health officials in our communities, and they should be urged to speak out against the hazards of teen age smoking. In addition to taking a public stand against smoking, they should also be urged to utilize opportunities to advise parents and teenagers of the harmful effects of smoking and to discuss with parents the relationship of their smoking practice to children's behavior. Almost twice as many teenagers with smoking parents take up the habit as compared with those teenagers of nonsmoking parents. Would parents, understanding this relationship, be motivated more strongly to modify their own habits? Also, would parents be less inclined to accept passively teen age smoking as accepted social behavior? Experience with a handful of parents who were presented with these concepts revealed they were more impressed with the idea that they should give up smoking than when confronted with only the medical evidence of the linkage between cancer and smoking.

Recently I was confronted with a teen age smoking problem in my family, namely that of my 14-year-old daughter. With your permission, I would like to share this experience with you.

The pressures of her peer group to smoke were building up. At this time, her health class (eighth grade) was in the midst of a unit on tobacco, alcohol, and narcotics, and they were examining medical evidence, tobacco advertising, and reasons why parents did or did not use tobacco. The usual arguments were presented to her parents, neither of whom, incidentally, smoke.

To be one of the gang she had to smoke! The girls who smoke were most popular with the boys! After all, she was an adult, almost!

Up until this time she had not smoked, but motivation to do so was at an all time high. We discussed the question of smoking and suggested several appropriate references, including one or two by Ann Landers. Her parents stated frankly that they hoped she would not smoke, but they also emphasized they knew she could and would, if she desired to do so! Since she was determined to experiment, either with or without approval, we suggested she do so in the privacy of her own room and with a product provided by her parents. This seemed agreeable, and one Saturday afternoon the big experiment was conducted with much coughing, spitting, and no coaching from her parents!

We also discussed with her rules of conduct which we felt should govern the smoking practice. These were as follows:

1. She should not sneak around and smoke but should do so openly at home, on the street, at school, and in other public places where permitted.

2. She should not smoke in bed, and she would be responsible for cleaning ashtrays.

3. She should consult her physician to determine the number of cigarettes she could safely smoke without impairing her health.

4. She would purchase cigarettes with her own money.

She was agreeable to these regulations but stated rather frankly that we took the fun out of smoking when we didn't make a fuss about it. She seemed to appreciate the frank, unemotional approach which we took with her. Several months have passed, and she does not smoke nor does she seem to want to begin the habit, in spite of the fact that some of her friends sneak around and do so, a fact which she freely volunteers to us. She became interested in lungs and respiration at this time, and her interests led to the development of a science project on this subject.

Research suggests that youngsters react favorably to an unemotional intelligent, straightforward approach. The focus should be on teaching, not preaching, the facts to help the youngsters increase their knowledge and find their own answers. In this case, there was a readiness to learn, and the parents were able to support an educational process that was also in progress in school. Note, however, that the parents did not say to smoke if she wanted to. They acknowledged she would if she wanted to but emphasized that they preferred that she not smoke. We might emphasize that research suggests this approach works well with girls rather than setting forth a direct prohibition against smoking.

At this point it would be well to again ask the question, do parents want their children to smoke?

Since parental behavior seems related to smoking patterns of youth, would they be willing, understanding this, to modify their own smoking patterns? We have the responsibilty of using every avenue of learning to help parents understand this relationship, and the educational avenues developed by the tuberculosis associations could be used appropriately and, I believe, quite effectively, for this purpose. Most research encountered in preparing this paper was directed to teenagers. We also need to examine more specifically parental attitudes towards teen age smoking, determine their concerns, and explore with parents ways in which they believe the hazards of smoking could be brought effectively to the attention of parents and youth. If we can bring parents, as well as teenagers, into a partnership with the teacher, physician, and public health worker, we may be able to dispel the idea that smoking must be an accepted adult behavior pattern. We do need to help youth understand that intelligent, fine people smoked before the hazards of cigarettes were known and youth should not be disrespectful of adults who do smoke.

The role of the school and teacher in teen age education is most important. The capable teacher, given assistance with background information, will be able to develop effective learning experiences appropriate for each grade level. He will know when the learning readiness level is high and will be sensitive to the basic needs of children, and this will vary with children and communities. He will also be able to adapt his educational methods to this problem, as he does with other curriculum areas. Unfortunately the basic training of teachers does not equip them with content information about the harmful effects of teen age smoking practices needed to do an effective job. In the current curriculum squeeze, teachers are hard pressed to find time for effective health education. From experiences with teachers in our area, we found that they were not well informed about the teen age smoking problem and its harmful effects. There was no acquaintance with the very good teaching materials available from the American Cancer Society. We sought to determine their interest and desire to do something about the problem in their schools, and we were given a most emphatic welcome when assistance was offered to them.

Very few teacher educational programs prepare the teacher to handle adequately the problem of teen age smoking and, for that matter, many other pertinent health problems. Continuing programs of health education in schools require well prepared teachers. State certification requirements are minimal, and teachers do need help. According to an official of the National Science Teachers, the preparation of science teachers for teaching such topics as alcohol, tobacco, and narcotics is probably the exception rather than the rule. The pattern of preparation is probably affected by the nature of state laws and regulations requiring such instruction. Health education teachers have been exposed to more content than have general teachers at the junior high level. But, workshops and conferences for teachers, parents, and youth have been readily received and found to be effective, and more opportunities for such assistance should be offered them. Such workshops which would bring many resource groups to the aid of the teacher, could focus on basic medical information, teen age cultural patterns, methods effective in presenting information to youth, procedures for combating tobacco advertising, and educational materials available and effective for use with adults and youth. The voluntary health agencies, and especially the tuberculosis associations with their long history of effective school health work, can and should take the leadership in offering this assistance.

In summary, with our present knowledge and skills, we can do much to prevent teen age nonsmokers from becoming smokers, if we are sufficiently concerned and are willing to take a stand on this issue. The problem of the confirmed smoker is difficult and requires the cooperative attention of many professional groups. Positive education leading to an understanding of teen age smoking by parents, teachers, and youth are to be encouraged. In summary, then, some suggestions for all of us to consider are the following:

1. An atmosphere must be created for frank teacher-student-parent discussions regarding cigarette smoking.

2. An adult, unemotional approach to youth is needed.

3. Education for youth should probably begin just below junior high level and continue through high school.

4. Parents should be informed of the influence of parent smoking habits on teen age practices and adult cooperation sought in developing teen age educational programs.

5. All teachers should be helped to know the basic facts about cigarette smoking and teen age practices and helped to use this information effectively in meeting the needs of their students.

6. Reference materials and resources should be provided teachers on a continuing basis.

7. Professional workers in public and voluntary health organizations, physicians, and educators should be urged to join forces to consider what can

be done in their communities to combat teen age smoking practices and to minimize the unfavorable influence of tobacco advertising.

8. Assistance should be sought from competent authorities to find substitute status symbols for adolescents and to counteract the identification of smoking with adulthood.

9. Careful studies should be developed and shared with others to determine the most effective educational methods and materials used in different communities with both youth and adults.

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There is only one thing that is and must forever remain first—that is the medical profession of America—as represented in this American Medical Association and its object which in all its aims is only one aim and indivisible. That one and inseparable object is to promote the art and science of medicine, to unite into one compact organization the medical profession of the United States for the purpose of fostering the growth and the diffusion of medical knowledge, of promoting friendly intercourse among American physicians, of safeguarding the material interests of the medical profession, of elevating the standards of medical education, of securing the enactment and enforcement of just medical laws, of enlightening and directing public opinion in regard to the broad problems of hygiene and of representing to the world the practical accomplishments of scientific medicine.

—Abraham Jacobi, *Presidential Address to American Medical Association, 1912*

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EDITORIALS

Connecticut Moves Ahead

The citizens of Connecticut are looking forward with optimism and pride to the opening of their new State Medical School. The foresight and care which has characterized the initial legislative planning for the institution clearly indicates the intent of the legislature to do all that it can to place the new school in the forefront of patient care, medical education and medical research. This is indeed fortunate, for the standard of excellence established at the founding of the school will have far reaching consequences, and will create the traditions essential for the progressive development and future success of the institution. In this regard the caliber of the men initially appointed to the faculty is of prime importance; optimum conditions must be ensured to attract the best available men and women.

The problem of securing an outstanding staff for a new school today, however, is becoming increasingly difficult. The growth of the population, and the increasing demands for improved medical care, has prompted many states to enlarge their existing medical schools, to convert two-year schools to four-year institutions, or to establish new medical facilities. At this time of unprecedented demand for faculty members, the number of qualified candidates has increased relatively little, creating an alarming shortage of able medical teachers and investigators. Since salary differentials in the universities across the nation have narrowed in recent years, other factors have become of primary importance to prospective candidates,—such as the cultural advantages of the area, or the opportunity, facilities and resources for research. One of the essential resources for medical research is the availability of experimental animals. Thus, it is unfortunate that the Connecticut General Assembly failed to pass a law regarding the disposition of impounded animals in its last session. In many other states these unwanted animals have been made available for medical research. We, in Massachusetts, are fortunate, for such a law was passed five years ago, ensuring an adequate supply of experimental animals from the hundreds of unwanted strays that would otherwise be put to death.

The University of Connecticut School of Medicine will open its doors in a period that has been called the Golden Era of Medicine. Great advances have been made in the prevention, diagnosis and treatment of many diseases. For the first time since statistics on the disease have been recorded, not a single case of poliomyelitis was recorded in Massachusetts during the month of August, 1962. Some of the dread diseases are so rarely seen today as a result of medical research, that the facilities for patient care have been changed dramatically. For example, the number of patients with tuberculosis has declined so sharply that many sanatoria have been closed, resulting in a savings of millions of dollars. In other areas we have been less fortunate. Half the hospital beds in the country are occupied by patients with mental illness, causing untold suffering to thousands of families and the necessary expenditure of millions of dollars. Only with the advent of the chemotherapeutic approach to the problem of mental illness has the upward trend of hospital admissions been modified in Massachusetts, and a decrease finally recorded. In our own field of interest—the cardiovascular diseases—hypertension and coronary artery disease are the great killers, attacking, all too frequently, in the prime of life. Much animal research must be done in these areas before significant advances can be made in the prevention and treatment of these diseases. Moreover, the recent tragic episode produced by the drug thalidomide clearly indicates that more animal research, rather than less, will be necessary in the years to come. Clearly, an adequate law is imperative.

We, in the medical schools in Massachusetts, look forward with pleasure to future collaboration with the fledgling University of Connecticut School of Medicine.

A. Clifford Barger, m.d.
Paul Dudley White, m.d.

A Unified Theory Of Atherogenesis

Has the arterial wall anything to do with the development of atherosclerosis. Some have focused on the likelihood that atherosclerosis is due to a disturbance in cholesterol metabolism or a dietary impropriety. There is little doubt that cholesterol does accumulate in the intima of arteries, that hypercholesterolemia is positively correlated with the severity of atherosclerosis and that diet conditions in some situations add to the severity of atherosclerosis. The ability to produce the experimental disease by simple feeding of cholesterol seemed to indicate that local factors of the wall itself were not critical.

How can it be that the arterial wall itself has nothing to do with the process? Why is it that the pulmonary artery is virtually immune to atherosclerosis except in patients suffering from pulmonary hypertension? Why is it that syphilitic aortitis and rheumatic arteritis in which scarring of the arterial wall is caused by inflammation, are accompanied by severe atherosclerosis. Why are the atherosclerotic lesions focal in nature, and that the sites of predilection for atheroma are also the sites at which stress occurs such as at arterial bifurcation where the breakdown of elastic lamellae is more severe than elsewhere? Clearly the arterial wall cannot be a passive tissue but is implicated somehow in the atherosclerotic lesion.

Beginning with the end of the second decade of life and becoming progressively more severe with the passage of time, there is a typical pattern of alteration in the elastic elements of the wall of human arteries.[1,2] The plates of elastic tissue which are the barriers to free movement of materials between the intima and media begin to fray, fragment, and calcify. This process continues throughout adulthood until finally there is no trace left of the original elastic lamellae. All that remains are masses of calcified fragments of granules of elastic tissue. This process of elastic tissue deterioration does not occur in the pulmonary artery, nor do atheromata form here except in pulmonary hypertension. Can it be that the breakdown of elastic lamellae is requisite to the formation of atheromata? If this were true, then the integrity of the elastic lamellae would determine whether cholesterol accumulations would occur in the intima.

Karsner[3] has studied sections from 500 human aortas at different periods of life and under different circumstances and found lesions of infectious disease in the aorta. In youth fat tended to disappear from the lesions and also in once obese persons dying of emaciating illness. Apparently arterial lesions can be caused by injury as well as cholesterol feeding. We were thus in need of an experimental method of studying the vessel wall both in man and the experimental animal following injury. Waters[4] method of damaging the vessel wall by injections of allylamide has added greatly to our understanding of the atherosclerotic process. The inflammatory lesions of the arterial wall so caused are very much like those caused by bacterial infections, hypersensitivity states or increased intravascular pressure produced experimentally in animals. The lesions are similar also to those occurring in hypertension in man. In each instance, there is an inflammatory response and associated process of repair. In Waters' experiments lipids did accumulate in the lesions, but did not remain unless lipid injections were repeated in which case lipid re-entered the vessel wall often selectively at the sites of prior injury. Repeated lipid injections restored the deposits in the wall and did increase scarring and finally led to progressive occlusion of the artery.

This type of experiment seems to parallel what happens in man. As the atherosclerotic lesion develops there is a relatively enormous accumulation of extra and intracellular fat in the intima where there is a large increase in connective tissue. The lesion is persistent and progressive over a period of years leading to gross atheroma formation, calcium deposit, hemorrhage and thrombus formation.

We are thus faced with two methods each of which leads to atheroma formation, arterial wall injury by whatever method, and hypercholesteremia in animals and man. Is there an underlying common mechanism? Electron-microscopic studies by Parker[5] offer a possibility of a dialectical synthesis of the two apparently opposite factors in atherogenesis. Parker studied early alterations occurring within the coronary artery of rabbits fed cholesterol experimentally. He noted striking alteration in the endothelial cells and the internal elastic lamellae. He observed focal lesions in the elastica characterized by decreased density and increased swelling. These lesions were more serious if the cholesterol were injected intravenously and were observed within twenty-four hours after injection. In chronic experiments in which high cholesterol was fed over a period of three months, large coronary placques were found almost obliterating the lumen and prominent elastic tissue lesions were also noted. Apparently, the basic lesion is a damaged elastic lamellae and cholesterol excess served to damage the elastica in the same way as did allylamide or any chemical or bacterial agent. According to Parker the internal elastic lamella is so injured by the cholesterol that a barrier is set up with the result that the lipoid masses were arrested at the surface of the elastica after traversing the endothelium. This led to placque formation.

The fact that the pulmonary artery is not subject to atheroma formation except in pulmonary hypertension may have wide implications. Perhaps it is the wear and tear upon the artery caused by the arterial pressure that finally leads to elastic tissue degenerations and atheroma formation. Perhaps some people are born with elastic tissue better able to withstand the years of stretch and stress from blood pressure than are others less fortunate genetically. It is interesting that reptiles, who operate at an arterial pressure half of that of man and birds, are not known to have atherosclerosis. On the other hand, animals like mamals and birds with elevated blood pressures, are widely afflicted by atherosclerosis especially in the aging populations.[6,7] However, the principle victim of arteriosclerosis is man. He is subject to a wider variety and more frequent attacks of infectious diseases than any other animal. He is living longer to the point when the stress of arterial pressure leads to degeneration of the elastic lamellae of his arteries, and he is probably more subject to lipemia from over eating than any other animal. If infections, hypertension and lipemia all cause atherosclerosis through damage t the elastica of arteries, then we are on sure ground in our efforts to reduce atherosclerosis by correctly treating infections, hypertension and lipemia.

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The Pineal Gland And Psychotic States

Lysergic acid diethyl amide (LSD) is a hallucinogenic agent and its psychotomimetic action was thought to be due to the serotonin antagonistic action of this compound. This led to the thought that metabolism of serotonin might be related to mental disease. One way of studying this problem was to produce radioactive serotonin and then follow the metabolic pathways of this hormone. In this way acetyl serotonin was identified and when serotonin was methylated in the O position, the derivative became in some respects more active than serotonin itself. This hormone then differed from the catecholamines because the latter became inactivated in the course of metabolism whereas serotonin derivatives became more active.

When the metabolism of serotonin seemed central to the biochemical concept of mental disease, a concept put forward by Wooley and Shaw,[2] then a search for serotonin in the central nervous system led to the unexpected result that the highest concentration of serotonin actually occurred in the pineal gland. What could it be doing there? Similar questions arose when diodothyronin was discovered in the thyroid gland and cholesterol in the adrenal. In each case the substances were found to be the precursors of the active hormone of these glands. It was therefore, not surprising that the idea should present itself to students in the field that the serotonin in the pineal gland was a precursor of some hormone elaborated by the pineal gland and that it is a gland having endocrine functions.

There are generally two methods used, in the beginning, to elucidate the function of a gland. One is extirpation of the gland and then a search for disorders resulting from this unphysiologic procedure. The other is administration of extracts of the gland. If however, the gland contains two or more hormones conflicting evidence is bound to develop, especially if inadequate numbers of animals are used in the study. Furthermore, if administration of a factor would cause another gland for example, the pituitary, to secrete an antagonist the problem of understanding the function of a hormone would be compounded.

Nevertheless as regards the pineal gland the use of the two methods, pinealectomy, and administration of pineal extracts has already left a definite impression that there is a relationship between pineal function and many of the activities we have hitherto thought of as residing in the pituitary gland such as bodily growth and development, pituitary gonadotrophin and the gonads, corticotrophin and the adrenal cortex, thyrotrophin and the thyroid gland, skin pigmentation and even carbohydrate and electrolyte metabolism. Recently potent pineal "hormones" have been synthesized[3-5] and we are well on the way to a clarification of actual pineal function.

One hormone melatonin is a serotonin derivative and the most potent substance known for lightening skin color of frogs.[4] By causing an aggregation of melanin around the nucleus of the melanocyte, it makes the cell appear lighter in color. It antagonizes the action of the melanocyte stimulating hormone of the pituitary (MSH) which is responsible for the pigmentation of Addison's disease. If radioactive melatonin is synthesized, it is possible to study what biochemical changes this hormone undergoes in the body. A minor metabolite was found which could be a carboline—though not yet absolutely established, which was a potent serotonin antagonist and had profound effects of a psychotic nature on trained rats as measured by their avoidance escape behavior.[5]

Hitherto, it had been assumed that carbolines like other alkaloids occurred in plants only, though what their function there was is not known. However, if you give a precursor to rats and use an enzyme blocking agent to prevent its rapid degradation, a radioactive derivative appears in the urine which strongly suggests the formation of a carboline in vivo.[6] Thus carbolines may be present in the mammalian central nervous system and we are face to face with problems concerning the action of what may prove to be a new class of hormones. Carbolines derived from serotonin like LSD possess psychotomimetic properties which might be due to their ability to block the action of serotonin.

Adrenoglomerulotrophin is another pineal hormone which in purified form is a tetrahydrocarboline having a powerful effect on causing secretion of aldosterone in dogs even in the absence of the pituitary gland.[3] This led to the following comment "from the evolutionary point of view transition from an aqueous to a terrestrial environment may have made necessary simultaneous adjustments in electrolyte balance and skin color in response to solar radiation. The finding of chemically related hormones in the same anatomical location—the pineal gland—and perhaps controlled by similar mechanisms is not entirely unexpected."

There is a close chemical resemblance of adrenoglomerulotrophin, a carboline derivative of serotonin, to another substance harmoline. This harmoline has long been known to be the active agent in "caapi" a potion made from a jungle vine and ingested by Peruvian Indians to produce hallucinations and delusions.

From an entirely different source comes evidence that a globulin tightly bound with a small molecule (taraxein) in the blood of schizophrenic patients can produce transient psychoses in man.[7]

One theory to explain the psychotic activity of chemical derivatives of normally occurring hormones in the central nervous system is that probably carbolines derived from serotonin play an important physiologic role in neural tissue, possibly by regulating neural transmission mediated by serotonin or nor-epinephrin. It can nevertheless be easily imagined that a psychotic state might result from the accumulation of abnormal amounts of such potentially psychotomimetic compounds. Being a potent monoamine oxidase inhibitor, once the balance is upset there would be a tendency for serotonin metabolism to be shunted along pathways favoring production of increasing amounts of the toxic agent.

Another explanation comes from Koella[8] who pointed out that sensory deprivation may induce psychotic symptoms such as hallucinations in man by reducing afferent impulses on the central nervous system thus reducing the irregular apparent bombardment of the cortical centers. Apparently this occurs when taraxein obtained from psychotic patients is injected into animals after which they experience both sensory deprivations and decreased variability of cortical potentials. Whatever the mechanism that causes psychotic states, one must now always think of a possible biochemical basis for them.

The pineal gland was recognized and named at least 2,000 years ago. Herophilus believed the ventricles were the seat of the mind and that the pineal gland was a sphincter that regulated the flow of thought. Galen later showed it was not a sphincter but a gland. But the greatest interest about it was created in the seventeenth century after Descartes pronounced it to be the seat of the soul. It may be ironic that it should have taken two thousand years for us to come full circle to agree with the philosophic concept of the ancient Greeks that the pineal gland is the seat of the emotions.

Incidental knowledge acquired in the study of one disease has often proved to be of great use in the understanding and treatment of another. From a practical point of view it may well be that the recently discovered hormones of the pineal gland may prove to be a real key to a better understanding of the cause of some types of mental, cardiovascular, and other diseases.

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The Cardioconverter

Until forty years ago there was no way of terminating rapid heart action except with digitalis. But this drug worked best in rapid atrial fibrillation and paroxysmal atrial tachycardia even though it provoked at times serious toxic reactions. In ventricular tachycardia and ventricular fibrillation it was useless. In the last forty years beginning with quinidine, procaineamide hydrochloride, potassium and magnesium salts, antihistamines and sedatives were successively introduced and this represents the drug era for terminating rapid heart actions. Each of these drugs have their value and their dangers. Procaineamide and quinidine may induce depression of cardiac contractility and excitability prolong atrioventricular and intraventricular conduction and induce a host of other untoward reactions. And besides, there are times when the ectopic arrhythmia is unresponsive to all drugs even when they are used in massive doses and in combination. Furthermore, it may take minutes, days or even weeks to terminate an ectopic rhythm. Ventricular tachycardia, where survival is threatened, constitutes a serious cardiac emergency if it cannot be terminated promptly. It is obvious that the drug era for terminating rapid heart action was not all that was hoped for. Fortunately, it is now drawing to a close with the introduction by Lown et al of the cardioconverter. This instrument delivers a brief electrical discharge of 3000-7000 volts across the intact chest for a brief moment. This is sufficient to depolarize the entire heart and extinguish the ectopic pacemaker. Within two seconds the sinus node resumes its pacemaker function.

What makes the cardioconverter different from other defibrillators is the form of the countershock and the part of the cardiac cycle in which it is delivered. Previously the electrical countershock was obtained from an alternating current. Its complications however were tolerated because it was employed as a desperate measure in a desperate situation. In short there was nothing to lose. It was well established that a sixty cycle current may itself electrocute. When AC is administered to animals transthoracically in normal sinus rhythm, there is a 20 per cent incidence of ventricular fibrillation. If they survive, then in a third of them electrocardiographic changes of anterior myocardial infarction appear. Lown et al[1] by changing the form of the countershock and by employing a very brief monophasic capacitor discharge, greatly diminished the occurrence of ventricular fibrillation to less than 2 per cent and did not encounter any evidence of myocardial infarction.

The period in the cardiac cycle in which to administer the countershock is important. If given during the downstroke of R it can produce atrial fibrillation. When delivered at the apex of the T wave which is the "vulnerable period", then ventricular fibrillation can be induced. By coupling the capacitor discharge with the R wave so as to deliver the shock at a non-vulnerable period in the cycle, the danger of both atrial and ventricular fibrillation has been avoided altogether.

The treatment of ectopic tachycardias by programmed countershock has now been tried in twenty-nine patients with thirty-five episodes of rapid heart action. In thirty-three regular sinus rhythm was restored in cases of ventricular tachycardia, atrial tachycardia and atrial fibrillation. Only two patients with chronic atrial fibrillation failed to recover regular sinus rhythm. This method of treatment obviously has a number of advantages over the use of drugs. It is simpler in application and more certain in immediate result. It does not require frequent electrocardiographic monitoring. It is applicable in both ventricular and supraventricular tachycardias so that differentiation between these disorders is no longer a critical factor in applying the therapy, whereas differentiation is extremely necessary when drugs are to be used. Finally, those features of safety and simplicity permit the use of the cardio converter by clinicians who are less experienced in the recognition and treatment of the arrhythmias.

The method is based upon two suppositions, one is that the factors which initiate the rapid heart action are different from those which continue it and the other is that once an ectopic site is momentarily extinguished, the sinus node will take over as cardiac pacemaker. Apparently the synchronized cardiac depolarization with the use of the cardioconverter is a nearly ideal method for terminating selected cardiac arrhythmias. It is simple to employ, the results are immediate, there is no evidence of depression of cardiac rythmicity or contractility, and there are no side effects. One limitation is the need for anesthesia which is achieved by intravenous thiopental for only two to five minutes. It is not yet known whether this can be obviated or substituted by the use of sedatives or narcotic drugs or both. This remains to be clarified by further study. However, even if the need for anesthesia remains a permanent feature of this method, the remarkable clinical results thus far achieved indicate that synchronized countershock will find application in the treatment of intractable arrhythmias.

Lown and coworkers are probably more restrained in evaluating the successes of the cardioconverter thus far achieved than will be others who take up its use. They modestly introduce a note of caution saying "Experience of physicians with other so-called wonder methods of treatment has amply demonstrated a significant gap between early promise and ultimate fulfillment. No method of treatment should gain unquestioned acceptance until the 'late returns' are in." When we know answers to the following questions the "late returns" will be in. Is anesthesia really necessary? Will synchronized countershock be successful in terminating all ectopic tachycardias? Can the method be used safely in the presence of advanced heart failure or after acute myocardial infarction? How many of the tachycardias after they have been terminated will recur and what drugs will be most effective as measures of prophylaxis? Regardless of what the answers are likely to be, we are in possession of a powerful safe method in controlling intractable rapid heart action.

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Treatment Of Acute Renal Failure

The kidneys are relatively insensitive to prolonged periods of ischemia and although urinary suppression may occur, recovery of the patient may be expected in every case in which ischemia occurs if the cause is promptly removed within a reasonable period. The most common cause of renal ischemia is shock. Here renal vasoconstriction is a protective device to shunt blood away from the kidney to sustain the general circulation. Prompt and appropriate measures to overcome the shock readily restores blood flow to the kidney and cures the urinary suppression.

Renal ischemia may also follow obstruction to the outflow of urine. This may be present at the neck of the bladder especially in males and is easily recognized. If, however, first one ureter and then the other becomes blocked by whatever cause usually stones, then the cause of the urinary suppression must be established by ureteral catheterization and promptly remedied. If, however, the cause of urinary suppression is intrarenal, it cannot be cured by active intervention of the physician as can the two mentioned above. Even then the majority of lesions are reversible and it is here that a thorough knowledge of renal physiology and function makes possible successful management, since a majority of the lesions are reversible if the patient can be kept alive in a reasonable state of health for a long enough time. The problem then is to combat the physiologic consequences of renal failure which result largely from two important renal functions:

(a) The function of maintaining a relatively constant volume and electrolyte composition of the extracellular fluid, and (b) function of removing certain products of catabolism no longer required by the body.

The water balance is not difficult to control if we regulate what is allowed to enter the body. The water intake must equal what is lost through any channel such as stool, urine and emesis, plus the difference between insensible loss and insensible gain. Insensible loss amounts to 800 ml. which is evaporated from skin and lungs if patient is afebrile and the environment temperate. Insensible gain is about 400 ml. derived from catabolism and preformed cell water. Thus in the absence of exterior losses there is a daily measured requirement of about 400 ml. This it should be recognized is an approximation at best and should be checked against careful daily weighing of the patient. If he loses 200-300 grams of weight daily from catabolism of tissue, it is indicative of a reasonably satisfactory fluid balance.[1]

The second function of the kidney is the removal of products of catabolism no longer needed by the body. We need not worry about sodium loss in a severely oliguria or anuric patient unless extra renal losses occur through emesis, diarrhea or drainage of wounds .In the latter cases obviously sodium should be replaced quantitatively. Nor is it necessary to be concerned with the end products of fat and carbohydrate metabolism which are CO_2 and water both of which are readily disposed of by the lungs.

Protein metabolism during urinary suppression can be reduced by administering 100 grams of glucose daily in divided doses, but there always remains some protein breakdown and products of protein metabolism may be expected to accumulate in acute renal failure. Urea constitutes the largest fraction of the nitrogenous moiety of protein catabolism. Fortunately, there is little evidence that urea at the highest concentration encountered clinically is directly responsible for any symptoms in man[2,3] and patients improve with dialysis even though the urea concentration in the serum remains unchanged at high levels. Indirectly, however, urea concentration may cause trouble since it is secreted into the lumen of the gastro-intestinal tract where enzymes convert it to ammonia. Here ammonia acts as a local irritant and has been held responsible for the anorexia, nausea and emesis encountered in uremia. If there is also associated liver disease, then the absorbed ammonia cannot be readily reconverted to urea, the ammonia concentration will rise in the blood and mental confusion and coma may appear as a consequence.[2,4]

Of the other end products of protein catabolism, sulphate, phosphate, hydrogen ions, and magnesium rarely present a clinical problem. The accumulation of potassium in the extracellular fluid however, does constitute a real problem, since sufficient elevation of this ion in the serum can lead to fatal arrhythmia, and cardiac arrest. In this connection it is well to remember that the electrocardiogram rather than the actual level of potassium serves as the best indicator in impending catastrophe. If the electrocardiogram shows changes that portend a threatened arrhythmia, then the indication for dialytic treatment is absolute to save life. There are temporary measures that can be begun in situations in which a life threatening arrhythmia is imminent. Infusion of dextrose and insulin and administration of sodium bicarbonate, should be begun while there is readied some other means of eliminating potassium from the body. If, however, a cardiac catastrophe is not anticipated within hours, then one can resort to a new sodium exchange resin (Kayexalate) . This is a powder that can be suspended in a small volume of water and either ingested or instilled rectally without untoward symptoms. The usual practice is to suspend 15 grams of the resin in 20 ml. of a seventy per cent sorbital syrup and administered four times a day. This procedure was found to be uniformly effective in lowering serum potassium levels in a group of severely oliguric patients.[5] As soon as the potassium levels of the serum falls to normal, it can be readily maintained at this level and prevented from rising again by administering the resin in five grain doses four times a day.

Bearing in mind the physiology of renal function, the management of acute renal failure is quite simple; complete rest to reduce metabolism, water in amounts so that the body decreases about 200-300 grams of weight per day; 100 grams dextrose in divided doses to spare protein; no sodium except to replace losses from the stomach, intestinal tract or wounds; no other intake; and caution about medications like antibiotics which will accumulate in the blood since they cannot be secreted in the urine. In an uncomplicated case of acute renal failure the onset of diuresis is seldom delayed beyond 10 days even if the renal lesion is due to a nephrotoxin such mercuric chloride, inhalation of carbon tetrachloride, sensitivity to sulphonamides and ingestion of an unknown nephrotoxin, and the mortality is virtually nil.

Acute renal failure, however, is not a benign lesion in the presence of complications. Mercuric chloride ingestion may produce hemorrhagic enterocolitis. The victim of carbon tetrachloride inhalation may have absorbed enough of the poison to destroy the liver before urinary suppression becomes the limiting factor that threatens his life. When acute renal failure is found in association with major surgical or accidental trauma or combinations of these the survival rate seriously declines. In Elkintons series[6] nine out of seventy-five patients suffered from a nephrotoxin, only the uncomplicated ones of which there were four survived The three deaths after carbon tetrachloride inhalation were caused by liver necrosis and two deaths from mercuric chloride poisoning resulted from infections secondary to gastrointestinal lesions rather than to renal disorders. Of thirty-eight acute renal failures that developed after operations or other trauma, twenty-eight died. Similar data were reported by Shackman *et al.*[7] The benign nature of acute tubular necrosis when uncomplicated can be seen from Strauss[1] series in which only one death occurred in 18,000 surgical cases and this patient died on the seventh day from pulmonary edema due to fluid overloading, a death that might have been avoided by proper management.[1]

It is interesting that no undue susceptibility to infection was found in the nephrotoxic group unless there had also been instrumentation of the urinary tract. Neither is infection more frequent in chronic uremia in spite of all the debilitating symptoms and anemia found in this group.

It appears that dialytic treatment is rarely indicated in acute urinary suppression unless a high serum potassium level threatens to set off a fatal arrhythmia or a patient is doing so poorly that dialysis may promise to help the patient tolerate other complications more successfully.[8,9] In the latter type of case, more properly controlled studies are still needed to help settle this question.

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New Light On An Old Disease. The Insulin Antagonist Hypothesis

After insulin was discovered in 1921 and it was demonstrated that it was successful in treating diabetic patients, it was only natural to assume that the cause of diabetes was a primary deficiency in insulin. It was thought that the severity of diabetes was dependent entirely upon impaired insulin production. Then cases appeared of diabetics who required much larger doses of insulin than those patients who actually suffered from pancreatic deficiency. The explanation that was offered was the insulin antagonist hypothesis which arose from the observation of Houssay in 1924 that the anterior pituitary probably through its growth hormone exercised diabetogenic activity. The insulin antagonist hypothesis was further strengthened in 1936 when Long, Lukens and Dohan clarified the relationship between the adrenal cortex and diabetes. In this way exacerbation of diabetes under stress was explained by an adrenal mechanism, as was the insulin resistance of Cushings syndrome, while the diabetes of acromegaly was attributed to the growth hormone. There was actually recognized that there was an increase in insulin requirements during increased pituitary activity, during puberty, and during increased hormonal activity of pregnancy.

The development of methods to measure insulin activity in the plasma also brought with them techniques to measure insulin antagonists in the plasma with the result that many hitherto obscure types of diabetes are now open to clinical investigation.[2] It is to be expected that the large number of categories of diabetes such as the juvenile, the adult, the obese, the insulin sensitive, the insulin resistant, the brittle will be recognized in the balance that exists in the plasma between insulin and insulin antagonists. Likewise the clinical subcategories of diabetes mellitus such as those associated with other endocrine disorders will also be clarified in terms of the balance in the blood between the quantity of insulin and the amount of its antagonist.

This new hypothesis may serve to clarify many aspects of diabetes that have been ill understood hitherto. It has already been found that the plasma albumin seems to carry insulin antagonists in greater concentration in insulin dependent diabetes, than the plasma of normal persons.[3] Furthermore, the plasma of hyperglycemic diabetes will inhibit the action of added insulin. The inhibitory substance seems to depend on the pituitary since it disappears after hypophysectomy. But it also depends on an adrenal cortical steroid.[2]

The emergence of the insulin antagonist hypothesis[1] may bring some order out of various aspects of diabetes that have not been well understood hitherto. In juvenile diabetes, we may find a high level of insulin antagonists in the plasma. This is found in the plasma of both obese diabetics and prediabetics but not in obese non-diabetics.[3] If the primary cause of the juvenile onset and maturity onset human diabetes is an abnormally high level of insulin antagonists bound to plasma albumin and if these antagonists depend upon the pituitary and adrenal glands, then the diabetes would be expected to vary with the activity of these glands.

It is interesting that the activity of insulin antagonist occurs in muscle, but not in fat.[4] Since a high level of insulin antagonist calls forth a larger production of insulin, this high level of insulin in the plasma in prediabetics or early diabetes would favor the growth of adipose tissue, in other words, of obesity generally found in newly diagnosed diabetes aged forty or more. This high level of insulin in diabetic patients may be responsible for the development of diabetic complications found both in juvenile onset ketosis prone and maturity onset ketosis resistant.

If insulin antagonists from the blood of a diabetic or prediabetic pregnant woman could be transferred to the fetus, this might explain the characteristic hyperplasia of the β cells of the fetal pancreas. Later in life, in the course of diabetes, with the increasing duration of the disease, there will develop exhaustion of pancreatic islets and then an insulin deficiency will parallel the decrease in pancreatic islets. In this view the development of diabetes would depend on an inherited liability to form excessive amounts of insulin antagonists. The insulin antagonist leads to a high blood sugar which in turn excites an excess insulin secretion. The time and type of onset of the diabetic state then would depend on the degree of antagonism and on the resilience of the β cells of the pancreas. It is clear that what is urgently needed to the further understanding of the pathogenesis of diabetes mellitus is to discover the nature of the albumin-borne insulin antagonist.

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Adrenocortical Steroids In Cancer

Adrenocortical hormones are among the numerous chemical agents that occasionally produce temporary palliation of symptoms in cancer patients; in a small minority, the steroids produce transitory objective changes with prolongation of life. The usefulness of adrenocortical steroids in treating solid tumors has, however, been overstated.

Their most striking effect is in inducing a high incidence of temporary remissions in acute leukemia in children and young adults. They are also useful in specific complications such as auto-immune types of acquired hemolytic anemia and idiopathic thrombocytopenic purpura. In patients whose tumors no longer respond to other measures, they may occasionally produce such subjective benefits as improved appetite, a feeling of well-being, and weight gain (mainly fluid) for a few weeks or occasionally longer.

Supervision — Close supervision is mandatory when adrenal steroids are used, because serious complications are frequent with prolonged high dosage; among them are psychosis, increased susceptibility to infection (notably "silent" infections), activation of tuberculosis, gastric ulceration and hemorrhage, diabetes, hypertension, osteoporosis, muscle wasting and general weakness.

Regression of cancer does occur in isolated cases. On the other hand, the disease may be exacerbated during treatment or when it is abruptly terminated; it is possible that adrenal steroids may hasten the dissemination of cancer and produce metastases in unusual locations. Studies have shown that adrenal steroids may shorten survival of patients with nonresectable lung cancer.

Lymphomatoses and Chronic Leukemias—Adrenal steroids may have favorable effects in some patients with chronic lymphatic leukemia and lymphosarcoma. They are not generally used in patients who are being adequately controlled by radiotherapy, the alkylating agents or vinblastine sulfate; but in patients who are becoming refractory to these agents, substantial objective improvement has been sustained with maintenance doses of an adrenocortical hormone. The percentage of response is higher in the lymphatic leukemias.

Adrenal steroids are considerably less effective in Hodgkin's disease, and should not be used, unless specific complications exist, before the advanced stages of the disease. Favorable reports of steroids in this condition are often based solely on apparent, subjective improvement, which is hard to evaluate.

Mammary Cancer—Adrenal steroids are among the late recourses in mammary cancer which progresses despite gonadal steroid therapy or oophorectomy. They may be worth trying before the highly toxic alkylating agents or 5-fluorouracil are used; and they are indicated for the control of hypercalcemia in mammary cancer metastatic to bone. Adrenal steroids may occasionally produce an objective remission of metastatic lesions which, however, usually lasts for only a few weeks or months. In debilitated patients they are a possible alternative to surgical removal of the adrenals or pituitary.

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THE PRESIDENT'S PAGE

The spectrum of the American System of the practice of medicine has changed much in the urban areas during the past three or four decades. Basic in principle as medicine is, there are influences, some good and some bad which the proponents of medical education, both teachers and practitioners should not allow to escape their vision. Current local factors, political influence, modern science and economics tend to erase the human element in the practice of medicine. People are human, they become ill, they desire and need the best medical attention.

Forty years ago major accident patients were referred to the hospital as they are referred today. Patients with difficult diagnostic problems were seen in their homes by a consultant who made both surgical and medical diagnoses. Only the most critically ill patients were referred to the hospital. It was possible to treat a high percentage of patients in the doctor's office or in the home. The doctor was expected to go to the home, if need be, and there were few complaints against the physician. The physician's office was located in his home or nearby.

Today the doctor has a downtown office and at 5 p.m. he goes home, a distance of 2 to 20 miles. Ill persons can no longer go to the doctor in his office in the evening. Some patients call his home, others call the telephone registry, others seek a physician nearby and still others in increasing numbers go to the hospital emergency room where they are sure to obtain medical attention. Like many things in America, this freedom of hospital emergency service is abused though its service is efficient. It is estimated that nearly fifty per cent of the patients who go to the emergency room could well be treated in the doctor's office. Thus we see medical economy is drifting away from the doctor's office to the hospital.

While there are many phases of modern medicine which are acceptable and favorable to the patient, we are neglecting some vital issues in the practice of medical discipline. The closing of doctors' offices at 5 p.m. without coverage, the eight hour, five day a week industrial medicine, the freeing of the hospital intern from Saturday morning to Monday morning without any continuity of thought and responsibility to his patients, all have a tendency to deprive a young physician of a portion of his dedication to the medical profession.

The introduction of the third party in the practice of medicine has done much to disrupt the physician-patient relationship. This physician-patient relationship must be honored in spite of all current influences working to dissolve this fundamental part of the practice of medicine. Medical discipline demands that the physician be continuously conscious of the greatest courtesy to his patients at all times and under all conditions. Dedicated physicians will under all circumstances live up to these principles. Medicine, in order to maintain the confidence of the people should protect itself with a discipline of steel that cannot be pierced by politics, governmental agencies or money.

Clyde L. Deming, M.D.

FROM THE GENERAL MANAGER'S OFFICE

William R. Richards, m.d., *General Manager*

James G. Burch
Director of Public Relations

160 St. Ronan Street, New Haven, Conn.
Telephone 865-0587

Josephine P. Lindquist
Assistant to General Manager

COUNCIL MEETING

Thursday, November 15, 1962

A meeting of the Council was called to order by the Chairman, Ralph L. Gilman, at 2:00 P.M. on Thursday, November 15, 1962. Present in addition to the Chairman were. Drs. Deming, Goldberg, Hess, M. Caplan, Cullen, Gardner, Scully, Wilson, O'Connor, Bradley, Cornwell, Grendon, Grant, Davis, Murray, Jr., Hughes, Dean, Gorman, Martin, Sundquist, Gevalt, Abbot, Phillips, Pitock. Also present: Mrs. Lindquist, Mr. Burch, and Dr. Richards. Absent were: Drs. Chartier, Egan, H. Caplan, Hastings, Beardsley.

APPROVAL OF MINUTES. It was VOTED to approve, as printed, the minutes of the meeting of October 24, 1962.

COMMITTEE ON ACCIDENT PREVENTION; SOCIO-ENVIRONMENTAL MEDICINE DIVISION. It was VOTED to accept the resignation of Louis Spekter, Hartford, as Chairman of the Committee on Accident Prevention and, by virtue of office, as a member of the Divisional Board of Socio-Environmental Medicine. Dr. Spekter remains a member of the Committee on Accident Prevention.

It was further VOTED to appoint Allan J. Ryan, Meriden, as Chairman of the Committee on Accident Prevention and as a member of the Divisional Board on Socio-Environmental Medicine to complete the unexpired terms of Dr. Spekter, resigned.

EXEMPTION FROM DUES. It was VOTED to exempt from payment of 1961 dues Joseph J. Higgins, New Haven, a/c physical disability. Through oversight, Dr. Higgins did not apply for exemption during his 1961 period of disability.

1962 AMA CLINICAL MEETING—LOS ANGELES.

a. As information, notice from the Middlesex County Medical Association was received voicing approval of the Resolution on Intern Quotas for Accredited Hospitals which the Society is introducing at the AMA Clinical Meeting in Los Angeles later this month. The Middlesex Association had voted to have such a resolution transmitted to AMA at its semi-annual meeting on October 11, 1962.

b. On recommendation of Denis S. O'Connor, New Haven, it was VOTED to direct the Society's Delegates to the AMA to support the following position with respect to the compensation of interns and residents, unless a superior plan should be presented at the Los Angeles meeting:

I. Formation of a non-profit corporation by the Medical Staff of the hospital to receive any and all monies accruing to licensed members of the Resident Staff from individuals or third parties for surgical or other professional services performed by House Staff members for staff or ward patients.

II. Funds received will be used solely for salaries, research and educational expenses of the Resident Staff of the hospital.

III. The Administration of the hospital will have no control over this fund, nor can the fund be diverted to other purposes.

THE 1963 BUDGET.

a. As presented by the Treasurer, accompanied by suitable explanatory material it was VOTED to approve the 1963 Budget as recommended by the Budget Committee, including the recommendation of the Committee that 1963 annual dues be set at $40 and to recommend approval of the Budget by the House of Delegates on December 4, 1962. It was further VOTED to accept the accompanying Report of the Budget Committee, and to keep the Report on file for the guidance of future budget committees.

b. It was VOTED *not* to include in the 1963 Budget an appropriation of $2000 for radio and TV programming, as requested by the Divisional Board on Public Relations.

CONNECTICUT MEDICAL SERVICE, INC.

a. A letter of reply from Insurance Commissioner Alfred N. Premo, dated November 7, 1962, was received. Responding to the Council's communication of October 15, 1962, Mr. Premo stated that he was "reluctantly approving the Amendment to the Preferred Contract" as presented to him by the Board of Directors of CMS, Inc.

b. It was VOTED to provide the CMS Board of Directors with copies of the Council's October 15th communication to Mr. Premo and Mr. Premo's November 7th reply, as requested by Mr. John Coolidge, President of CMS, Inc. in a letter to Clyde L. Deming, President of CSMS.

c. After making several minor amendments to two resolutions introduced by E. Tremain Bradley, Councilor from the Fairfield County Medical Association, it was VOTED to approve the resolutions and to transmit them to the House of Delegates, on December 4, 1962, with a recommendation that they be adopted by the House. The titles of the resolutions were as follows: Resolution No. 1—Definition of Certain CSMS Policies on Doctor-Care and Its Financing; Resolution No. 2—Increasing the Availability of "Service Benefits" Prepayment Plans.

d. Having received notice from Frank L. Polito, Torrington, that he is resigning as a member of the Board of Directors of CMS, Inc., effective December 1, 1962, the Chairman ruled that the Council might select a nominee to replace Dr. Polito on the CMS Board, pending notification from the CMS Corporators that a vacancy among the physician Directors exists and that the Council is requested to nominate a replacement. Three names were placed in nomination as follows: Michael A. Dean, Bridgeport; Max Caplan, Meriden; and Jachin B. Davis, New Haven. Drs. Dean and Caplan requested that their names be withdrawn from nomination. Since there were no further nominations, it was VOTED that the nominations be closed and that the Secretary cast a single ballot for Dr. Davis as the nominee to replace Dr. Polito, subject to the ruling of the Chairman as recorded above. Orvan W. Hess, Secretary, cast the single ballot for Dr. Davis as instructed.

REPORT OF AD HOC COMMITTEE ON MAA EXPERIENCE IN CONNECTICUT. As directed by the Council, the Ad Hoc Committee on MAA Experience in Connecticut filed a comprehensive report on the subject, basing its report on a meeting of members of the Committee with Bernard F. Shapiro, Welfare Commissioner, and Dr. Edwin R. Connors, Medical Director of the Welfare Department, on October 16, 1962. It was VOTED to accept the report as presented and to refer it to the Committee on State Legislation for study and suitable action, and it was further VOTED to recommend to the Committee on State Legislation that the Society introduce and/or support an amendment to P.L. 578 which would eliminate the $100 deductible provision.

THE CORPORATE PRACTICE OF MEDICINE BY HOSPITALS AND ALLIED MATTERS.

a. As directed by the Council, an Ad Hoc Committee of five members of the Council and the General Manager met with Attorney Edward L. Marcus, New Haven, to receive and review Mr. Marcus' report on the corporate practice of medicine by hospitals in Connecticut and the Blue Cross "Out-Patient Rider". As a result of its meeting with Mr. Marcus, the Ad Hoc Committee filed a report with the Council and made certain recommendations, including a recommendation that the Ad Hoc Committee be discharged. It was VOTED to accept the report and recommendations of the Ad Hoc Committee. Acting on one of these recommendations, it was further VOTED that the Council request each of the constituent county medical associations to call a special meeting, as soon as possible, for the purpose of obtaining from its members a collective opinion as to whether the Society should engage in legal or legislative activity regarding the corporate practice of medicine by hospitals in Connecticut and regarding the practice of making payments for physicians' services to hospitals by hospital service corporations. Informed members of the Council are to be available to each county association to outline the pros and cons of this matter to members at a special county meeting called for the purpose indicated.

b. It was VOTED to approve payment of Attorney Marcus' bill for services rendered in the amount of $3,565.

ELECTION OF STUDENT MEMBER. It was VOTED to elect Daniel M. Koenigsberg, New Haven, to student membership. Mr. Koenigsberg is attending the Albert Einstein School of Medicine—Class of 1966.

CANCER COORDINATING COMMITTEE. It was VOTED to refer to the Committee on State Legislation, for study and report at the next Council meeting, a resolution submitted to the Council by the Cancer Coordinating Committee. The resolution read, in part: "That the Council approve and support a Bill to be introduced in the Legislature (General Assembly) which will provide a yearly additional sum of $90,000 (to be used to continue the effective operation of the Tumor Registry and Tumor Clinic Program); (and to) recommend to the Committee on State Legislation of the Medical Society that it begin action to prepare and introduce such a Bill. The Cancer Coordinating Committee is ready to assist when called upon".

DATE OF NEXT MEETING. The tentative date for the next meeting was set for Wednesday, December 19, 1962, the need for a meeting to be held on that date to be determined jointly by the Chairman of the Council and the General Manager.

Clinical Medicine

The Effect Of Strain And Trauma On The Heart And Great Vessels

Louis H. Nahum, M.D.
New Haven

Whether a trauma, penetrating or non-penetrating, can cause contusions to the heart and great vessels is not in doubt and many documented cases of this nature have been published.[1] In such instances the problem is essentially to think of the possibility of cardiac injury whenever blows on the chest have occurred. Early and repeated electrocardiograms are very helpful in establishing a diagnosis of cardiac contusion. Most patients may not be aware that they have sustained superficial injuries to the heart surface. Healing takes place quickly, often leaving no evidence of its occurrence a few days later. There are of course, much more serious injuries to the heart that can be caused by automobile and blast that can seriously damage the heart by physical force but such injuries are easily recognized and there is no air of obscurity or controversy about them.

Most of the problems which bedevil both the doctor and lawyer have to do with the question of whether strain can cause acute myocardial infarction or heart failure, and how remote in time may the episode of strain be, in order to establish a causal relationship between itself and infarction? The answer to this question would involve a knowledge of what is known at present regarding the effect of strain. Any investigation of this question would direct most of its labors on to the problems of coronary artery disease, although sufferers from other etiological types of heart disease could also experience cardiac breakdowns under certain conditions of trauma and strain.

Recognizing the magnitude and complexity of these and related questions the American Heart Association reconstituted the committee on the Effect of Strain and Trauma on the Heart and Great Vessels under the Chairmanship of Dr. Paul D. White. Because the courts like the medical profession have an urgent contemporary interest in the effect of strain, two sub-committees were appointed: one to be concerned with the medical-pathological, and the other with the legal aspects of this study. The medical-pathological committee was composed of Drs. Helpern and Plummer while the legal aspects of the problem was extensively investigated by Professor Harold F. McNiece, Dean and Professor of Law of St. Johns University Law School who published his findings in a volume in 1961 entitled "Heart Disease and Law: The legal basis for awards in cardiac cases." The full committee that was created by the American Heart Association has published its report which combines both medical and legal findings.[2]

Causation Medical And Legal

The committee early recognized the difference in the approaches to the problem of causation by the medical and legal profession with regard to attributing cardiac breakdown to stress and strain. The physician speaks of *the* cause, the lawyer of *a* cause. The physician recognizes atherosclerosis as a disease in which a great many factors play a part. It is now recognized that in any disease both genetic and environmental factors interact. The complexity of "Causation" or the etiology of myocardial infarction is illustrated by the International symposium on this subject held in Detroit, Michigan in November 1961.[3] Thirty-eight papers were delivered and differences were noted in opinions, interpretation of the literature and investigation by the members in which over thirty causes were dealt with, including the central role of hydraulic forces as applied to the coronary circulation.

The lawyer, on the other hand, would be satisfied with any of these causes if it could be shown that it contributed in any appreciable degree to the heart disease or heart failure in the case under consideration. As Small[4] says "his is not the function of identifying influences towards harm which may be

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found in pathology, instead his is a function of identifying influences towards legal responsibility for harm that may lie in the habits and behavior of the surrounding society in which man and his pathological risks are cast. A doctor's thinking because of his special type of training is bent in one direction; in the risks of nature and away from the risks of man's invention and oversight." In relation to atherosclerosis one might say in Small's words "aggravation, acceleration, activation—to the doctor they are part and parcel of the natural and inevitable pathological process in cause; they *are* the process." So understood they leave little room for strain or trauma in the causal spectrum. To aggravate aggravation, to accelerate acceleration, to make the inevitble more inevitable are foreign to the doctor. True fate may be hastened in a day or two or slowed to the same degree but fate remains; and its cause can scarce be laid to the fixing of the day."

Specific Aims Of The Committee

The committee was not concerned with the effects upon the heart and circulation of obvious trauma. They noted that stress and strain are rarely involved in the causation of heart disease as an occupational disease except in instances where heart strain is secondary to pulmonary disease which is itself of occupational origin such as silicosis and berylliosis. In addition there are states in which the legislature have passed so called "heart laws" proclaiming that in the case of certain favored employees such as firemen and policemen, the development of heart disease or hypertension is presumed to be service connected—in other words, legislative fiat defines them as occupational disease.

The medical pathological committee limited its studies largely to the physical activities within a few hours of the attack of victims of acute myocardial infarction or of those dying suddenly or unexpectedly who were proved by autopsy study to have died of coronary heart disease. Not considered by the committee was the effect of strain and trauma on other etiological types of cardiovascular disease; nor their possible effect on long-term development of atherosclerosis; nor to unravel the influence of the emotions on the course of coronary artery disease. But the whole committee report did concern itself also with these questions.

The committee was confronted by the need to define what is meant by strain; what the mechanism is by which alleged strain operates to accelerate symptomatic myocardial infarction or sudden death *i.e.* aggravation of pre-existing coronary disease; finally, how remote in time may be the event which could reasonably be invoked to establish a causal relationship between itself and an acute coronary occulusion, myocardial infarction or death. The committee noted other features which in the past have confined the whole subject to the status of speculation and opinion.

One has been the need to limit a causal relationship to the events occurring at the time when symptoms or sudden death appear. In the instance of sudden death immediately following a severe strain, it is reasonable to attribute the death to physical activity, for here there is a sudden increased demand upon inadequate coronary arteries which may precipitate angina pectoris, or a sudden abnormal rhythm or cardiac standstill and the individual may or may not die from this attack. In such instances the pathologists find that the sudden death occurs more often than not without any fresh acute occlusions in over 80 per cent of cases.

The story is quite different when an attempt was made to establish causality in the precipitation of coronary occlusion by physical effort. For when the committee found acute thrombotic occlusions and myocardial infarction, they appeared to have been present long before recognizable symptoms, and this even in the case of sudden death without symptomatology. In other words a patient, who develops chest pain at his work, has already had pathological evidence of occlusion and even infarction for hours or even days before the first symptom appeared. They therefore could find no reason to conclude that the beginning of occlusion of the coronary artery is ushered in by symptoms. As a result, the medical-pathological committee concluded that no clear explanation exists to establish causality in the precipitation of coronary occlusion by physical effort.

The committee also gave thorough consideration to the theory that increased cardiac work may cause subintimal hemorrhage in atherosclerotic coronary arteries which in turn would lead to thrombosis. This theory has been quite vigorously espoused, but was discarded because the committee found subintimal hemorrhages in 80-90 per cent of all patients dying of coronary disease. Such a finding makes it seem likely that the hemorrhages are a part of the natural development of the degenerative process in the artery and cannot be related to any particular stressful incident. This in no way reduces our respect for the importance of these hemorrhages in abruptly reducing or closing the lumen. In short the committee found no anatomical pattern pathognomonic of the influence of stress

Once an infarct had formed but the person continues to work for a while the question arises whether, from this time on, the prognosis of the patient is prejudiced by his work even though it is not excessive in ordinary terms. After careful study of such cases the committee noted that the prognosis in infarct is better in those in whom infarction occurs at work and that the degree of activity at the time of the attack does not affect the prognosis. This is a most unexpected finding which negates the thesis that impending infarction is made worse by accustomed physical activity. We have for a long time been dominated by the Rest Dogma[5] especially in coronary artery disease. For a long time we have feared to move our acute coronaries about in bed and until the era of anticoagulants, witnessed many cases of thromboembolic disease as a result. Studies on dogs surviving infarction paralleled studies on man. The dogs had no bed rest and their freedom from cardiac rupture has given all of us reassurance, that activity may not be prejudicial to healing from infarct.

In what way the prognosis is made better in the case of the patient at work who experiences a myocardial infarct is not immediately clear. Perhaps the activity promotes a collateral circulation, or increases the flow through the coronary arteries in cases where there is no clot or minimizes clot extension where one is forming. There is clearly an important point here for further study. Whatever the explanation, the finding of improved prognosis in patients whose infarcts formed at work is important to the physician who treats such cases and to the patient who is so treated. From the medicolegal standpoint, it is clear that the appearance of symptoms is not the time the occlusion began, and that ordinary activity of the patient at the time when symptoms did begin, does not prejudice the outcome.

The committee has taken cognizance of the fact that an important degree of atherosclerosis of the coronary arteries is present in approximately 50 per cent of all males over the age of forty-five in the United States. In many instances, this produces no symptoms in the individual at his customary level of activity whether physical or nervous. However, in such individuals a certain number following either usual or unusual activity will reveal the underlying disease when the coronary demand exceeds the coronary blood flow. Such a situation will produce the symptoms of angina pectoris.

During an anginal attack or one of coronary insufficiency sudden death may occur if a rhythm disturbance such as ventricular fibrillation or cardiac standstill, supervenes. In a few instances, less than 20 per cent, coronary death is associated with fresh coronary thrombosis. In the other 80 per cent of cases of sudden death with or without evident precipitants, microscopic infarction may occur with extremely narrow coronary arteries in the absence of demonstrable complete occlusion, either by thrombus, intimal hemorrhage or rupture of atheromatous placques.

Either through the natural progress of the occlusive coronary process with symptoms occurring at rest, or by stresses such as severe exertion, shock hemorrhage, pulmonary embolism and excitement, degrees of myocardial ischemia may ensue to a point of patchy perhaps only microscopic infarction of heart muscle often endocardial.

Thus the committee recognized what is well established in clinical experience that coronary insufficiency as distinct from infarct may be a result of factors mentioned above provided clinical and electrocardiagraphic evidence appears during the activity of these events

By contrast the committee finds no method either clinical or pathological of determining the causative relationship between any given event and typical coronary thrombosis with infarct. The time of onset of the occlusive attack often cannot be determined without an autopsy study, and one cannot draw any conclusions concerning the relationship between a coronary occlusive attack and the events preceding it on the basis of clinical data. Often even a meticulous necropsy examination is of no help in this regard. At present we only have the appearance of clinical symptoms, as the guide in attempting to evaluate a connection between an environmental event and a coronary response and this is reliable only in cases of angina pectoris and severe myocardial ischemia and unreliable in myocardial infarction following occlusive disease

There is no problem in cardiac disease other than coronary disease, such as congenital, syphilitic, hypertensive, and rheumatic for it is well recognized that in these conditions strain or trauma can precipitate serious disorders of the circulation, such as acute cardiac dilatation and failure, pulmonary edema and a rapid death. This is particularly true of mitral stenosis, severe aortic stenosis, syphilitic aortic aneurysm and a large hypertensive heart. However, the committee holds that heart failure either of the congestive type with acute cardiac dilatation or rhythm disturbance, or of the coronary insufficiency type (with angina pectoris or other evidence of myocardial ischemia or sudden death, or of the myocardial infarction type with or without survival), shall be considered related to physical or emotional exertion only if the heart failure occurs during the actual period of stress, clearly *unusual* for the individual involved.

The medical pathological subcommittee concluded that unlike angina pectoris, acute myocardial infarction is an unexplained occurrence without any demonstrable relationship to any precipitant except for events causing acute hypotension, such as shock and hemorrhage or arrhythmia. Without autopsy study and sometimes even with careful morphological examination, the relationship between coronary thrombosis and the events preceding it cannot be determined. The suggestions of the medical-pathological subcommittee are "That heart disease except in rare instances shall not be considered as arising from employment. It is recommended also that the heart failure of the congestive, coronary insufficiency, or myocardial infarction types shall be considered related to physical or emotional exertion only if the heart failure occurs during an actual period of stress clearly unusual for the individual involved."

The Legal Subcommittee Report

The legal subcommittee based its report upon its own judgments and the extensive review of Professor Harold F. McNiece. The committee points out that the courts have not labored under any assumption that cardiac disease can be caused in a previously healthy person by strain, stress or a nonpenetrating trauma. (Parenthetically, the last can occur and has been amply documented in the literature).[1] The question nearly always has been whether or not the claimant's previously existent heart disease was aggravated by these factors. It points out that medical certainty will not solve the case where a workman's pre-existing heart disease irrespective of its cause has advanced so far that strain or other incident in the course of employment becomes the final straw which destroys the victims ability to work or causes his death. Here the question is at what point for "compensation purposes" shall the element of work-connected be viewed as *"de minimis"* and the cardiac disability held to be merely coincidental with rather than "caused" by the work connected event.

Then there arises the case where the workman who has apparently been in good health suffers cardiac symptoms immediately following an event at work especially if the event is out of the ordinary such as extra heavy lifting. Another instance would be the case of the workman who continues to work despite the onset of cardiac symptoms instead of resting and seeking medical assistance. Another instance is that of the worker who proceeds to his place of work despite having already experienced chest pain or other cardiac symptoms. Such basic problems and others the Legal Committee believes will remain with us despite advances in scientific knowledge as to the causes of heart disease.

The subcommittee emphasized the semantic problem faced by the medical witness, since to the physician, causation suggests etiology, but to an attorney or even a court it may mean a slight degree of aggravation. Professor McNiece points out "the powerful suggestion of cause and effect embodied in such a chain of events (as mentioned above) may hold too great an attraction for a compensation referee or jury to be overcome, even by generally accepted medical principles which negate causation . . . Even now many states take the position that a finding of causality is *a reasonable inference from such facts* even in the face of contrary medical opinion evidence." Even though to a lawyer, causation may mean a slight degree of aggravation, nevertheless, the legal subcommittee recommended that "an unusual strain should be the only injury recognized as aggravating underlying cardiac pathology." As Dr. Sprague pointed out "public opinion, not medical opinion is now the deciding influence in this field. Our disputes will never be resolved by clinical statistics nor indeed by any statistics or probabilities, so long as attorneys can produce physicians who will testify to the validity of highly improbable possibility."

Many members of the committee apparently believe that physicians, pathologists and lawyers cannot solve the matter of the relation of acute coronary occlusion to stress and strain and therefore, have agreed that the practical answer is to remove heart disease from Workman's Compensation and cover its ravages in industry by comprehensive medical care insurance. They are sure that under Workman's Compensation the rehabilitation of the injured worker has often been neglected and that under insurance coverage the provisions for sickness-disability payments will turn out to be more favorable to the employee.

The whole report is a thorough and learned study of the complex matter of strain and stress as it is related to various aspects of diseases of the heart and great vessels and should lead to a more equitable and more meaningful medical testimony in Workman's Compensation cases. It should also provide an authoritative reference for physicians and attorneys.

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Clinical Pathological Conference

YALE-NEW HAVEN MEDICAL CENTER

Participants:

DR. ELISHA ATKINS
DR. COURTNEY BISHOP
DR. ROBERT CHASE
DR. IRA S. GOLDENBERG
DR. DONALD P. SHEDD

SURGICAL GRAND ROUNDS

Dr. Goldenberg: Grand Rounds today is a combined effort of the University and Memorial Unit services. Two recently admitted patients who were critically burned form the back-drop for our discussion today. There are several speakers who are going to cover some of the key issues in regard to the treatment of the severely burned patient. The first case from the Memorial Unit will be presented by Dr. Callahan.

Dr. Callahan: The first patient is a 33-year-old white married male who was admitted to this hospital July 10th of this year because of extensive burns. While repairing a high-tension wire on top of a telephone pole, a short circuit occurred igniting his clothing. The patient became a human torch. His partner was able to carry the patient half way down the pole but then lost his footing and the patient and his partner fell the remaining distance to the ground. The patient was taken to the Emergency Room at the Grace-New Haven Community Hospital. Physical examination revealed the patient to be in acute distress but with essentially normal vital signs. The pertinent findings were confined to the examination of his burned areas. The burned areas included almost the entire trunk anteriorly and posteriorly, both buttocks, both thighs anteriorly and posteriorly, and the upper posterior aspect of each calf. It was estimated that approximately 59 per cent of the total body surface was involved. It was felt that less than 10 per cent of the body surface was involved with the third degree burn. Subsequent evaluation, however, over the next several days proved that the third degree burn included almost the entire burned area, or at least two-thirds to three-fourths of the entire burned surface. On admission the patient's hematocrit was 46. The patient was placed on a Foster frame. He was given penicillin, streptomycin, tetanus toxoid, and fluid therapy was initiated. A Foley catheter was inserted into the urinary bladder. The fluid therapy was calculated on the basis of a 50 per cent body surface burn, the calculations being made according to the formula proposed by Evans. During the first 48 hours he received some 15,000 cc. of fluid, approximately 5,000 cc. of which was colloid. During the acute period, his hematocrit rose to about 70, but as hydration commenced, his hematocrit fell within the next 48 to 72 hours to a normal range. The fluid intake was regulated to maintain a urine output of 25 to 50 cc. hourly. By the fourth hospital day, the patient had begun oral clear fluids. On the ninth hospital day, resistant staphylococcus aureus, coagulase positive, organisms were cultured from the burned areas and the patient received a sequence of antibiotics which included penicillin, streptomycin, Kanamycin, Chloromycetin, Ilotycin, and Staphcillin. Fortunately, no septicemia occurred. The antibiotic therapy was complicated by a fungal stomatitis which responded to Mycostatin. The patient experienced an episode of acute paranoia which lasted 24 hours.

Since admission the patient has lost somewhere in excess of 50 pounds. His nutritional status, however, has been reasonably good as he has been able to maintain a caloric intake greater than 3,000 calories daily. With the exception of his upper extremities, the patient is essentially immobile. The slightest jarring causes severe pain. Local treatment to the burned areas have included occlusive dressings, frequent dressing changes, and multiple skin grafting.

DR. ELISHA ATKINS is Associate Professor of Medicine, Yale University School of Medicine, New Haven.

DR. COURTNEY C. BISHOP is Clinical Professor of Surgery, Yale University School of Medicine, New Haven.

DR. ROBERT A. CHASE is Associate Professor of Plastic Surgery, Yale University School of Medicine, New Haven.

DR. IRA S. GOLDENBERG is Assistant Professor of Surgery, Yale University School of Medicine, New Haven.

DR. DONALD P. SHEDD is Associate Professor of Surgery, Yale University School of Medicine, New Haven.

He has been taken to the operating room 20 times and received a general anesthetic each time. Thirteen skin grafting procedures have been carried out. At the present time he is uninfected. Approximately 30 to 40 per cent of the original burned areas have been covered with grafts.

Dr. Waltuch: The second patient is a 34-year-old Negro male admitted to the Emergency Room one-half hour after suffering extensive burns of the body. His clothing became ignited after throwing gasoline on a fire. He suffered 17 per cent first degree burns, 47 per cent second degree burns, and nine per cent third degree burns. These calculations later proved to be incorrect. Most of the second degree burn was third degree. On admission a cut-down was placed and fluids were administered according to the Brooke Army Hospital formula. The wounds were debrided and dressed with bulky petrolatum dressings. The patient was given tetanus toxoid, started on penicillin and streptomycin, and placed on a Foster frame.

His hospital course was marked by the early appearance of sepsis. His temperature rose to 101.8 on the first hospital day and the next day it was 103.2. On the third day he was taken to the operating room, the wounds were debrided and dressed, and it was at this time noted that much of what was originally considered second degree was indeed third degree burn. On that day his fever rose to 105 and from that point on, it varied between 102 and 105. On the third hospital day, Pseudomonas was cultured from his skin and on the fourth hospital day, it was cultured from his blood. Chloromycetin was started on the fourth day with intravenous penicillin. On the fifth hospital day, Polymyxin therapy was started. On the sixth day he was again taken to the operating room, debrided and dressed, but unfortunately his septic course continued in spite of initiating intravenous Chloromycetin, intramuscular Erythromycin, and two days before his demise, Cholemycin was started. On the 11th hospital day, he died.

Dr. Goldenberg: There are several reasonable divisions of care of patients such as we have presented here. The major problem is that of immediate care followed very quickly by the problems of fluid administration, infection and management of the burn wound. This is a general outline that we are going to follow this morning. Dr. Bishop first will discuss the problem of the immediate care of the severely burned patient.

Dr. Bishop: The first patient presented is fortunate to be alive. Effective team effort was initiated and has been maintained in respect to this patient's care. The success of the grafting of the buttocks has been dramatic and has been very significant in terms of the patient's progress.

I would like now to reemphasize several essential steps in the emergency care of the severely burned patient. The first step is a rapid evaluation of the extent and degree of burn. We are familiar with the conventional criteria by which degree is determined. We all instinctively tend to underestimate the degree. I think that the case histories that have been presented this morning suggest again this possibility. The line between the reddened, mottled skin surface of the advanced second degree burn which may not yet actually produce blisters, and the marbleized skin of the penetrating deep third degree burn is sometimes difficult to ascertain. Charring is not a requirement for a definition of a third degree burn. In addition to an estimate of the degree, one must evaluate extent because it is actually a summation of these two factors rather than one or the other independently which should be the initial index determining the approach to the patient's problem. The "rule of nines" is a convenient formula with appropriate correction for infants and small children.

Efforts are made to alleviate so far as possible the patient's pain and discomfort. One should remember that as the severity and extent of the burn increases, pain is decreased. The reverse is true with the lesser degree of burn. In the severely burned patient, tolerance to narcotic drugs is apparently somewhat reduced and relatively small amounts of the conventional drugs such as morphine or Demerol will be effective. Intravenous administration is to be preferred because of its more rapid effect. Hysteria in the patient or in the patient's immediate family is often a problem.

Establishment of an adequate intravenous route for administration of fluids is a demanding necessity. Obviously if extremity subcutaneous veins are easily available, vena puncture is the most rapid approach. One must be aware of the fact that there may be a need for intravenous therapy over significant periods of time and in many instances deliberate choice of cut-down approach becomes desirable.

An evaluation of the status of the patient's tracheobronchial tree is a fundamental requirement. Many patients with severe and extensive burns will, in addition to the surface burns, have damage to the tracheobronchial tree, either by the inhalation of heat or by the inhalation of irritating smoke or other gaseous elements. These patients rapidly develop demonstrable changes in the tracheobronchial tree characterized by edema and accumulation of secretions. Effective management requires the prompt and early institution of tracheostomy.

Infection is a paramount factor which overshadows the total problem. Penicillin and streptomycin as prophylactic drugs must be given. Patients who have had prior tetanus immunization should be restimulated with a booster dose. There is some debate as to the use of passive immunization in the form of tetanus antitoxin. More important than the problem of the antibiotic prophylaxis is the institution of adequate and safe procedures in handling the patient and the control of air-borne or contact contamination. This is commonly spoken of as isolation technique and is probably a poor term. It should properly be described as the institution and maintenance of aseptic precautions and is just as important in the Emergency Room as on the floor after the patient's arrival.

Constant urinary bladder drainage is an essential requirement for evaluation of the patient. This is emphasized when burns in which other indices, namely color, appearance of skin, the appearance of nail beds, or the use of the sphygmomanometer may be prevented by the existence of the burns themselves. Many patients experience varying degrees of paralytic ileus or acute gastric dilatation. Withholding fluids if there is an indication of gastric dilatation and prompt institution of nasogastric suction is sometimes necessary.

There are two thoughts that I would like to leave with you. Frequently there will be associated with major burns, major fractures of extremities, spine, or skull. In my own opinion management of the patient in the initial stages of his injury still is and properly should be the problem of the general surgeon. There are fundamental emergency procedures which can be applied in the management of the other traumatic injuries and if the survival from the burn is not accomplished, there will be no requirement for clinical management of the associated injury. The specific management of those injuries should be secondary to the resuscitation of the patient. Practically all patients with burns of 20 per cent of the total body area or less irrespective of what is done will survive. In contrast, patients with 50 per cent burns or more almost invariably succumb to one or the other of the complications of the disease. There are survivals with greater burns but in general patients with 50 per cent burns or more fail to survive the incident. This is true in adolescents, young adults, and through early middle life. Infants and small children and adults over the age of 60 have a greater mortality. The problem of burns in massive numbers is an almost overwhelming problem and attention should be delivered to the young, healthy adult and those of early middle life whose burns are in the range between 20 and 50 per cent. For the practical reason of necessity, the remaining burns must receive secondary treatment.

Dr. Goldenberg: Because our understanding of the pathological physiology of burns is incomplete, our greatest problem is treatment of fluid and electrolyte shifts intelligently. Our competence is greatest in appraising the volume and rate of fluid losses; it is least in appraising their composition. Many formulas for calculating fluid treatment of the burned patient have been devised and except for minor variations are all the same. It is not the formula *per se* that is important, but rather the recognition that a fluid deficiency exists. I am not going to talk any more about formulas today; rather, I would like to discourse briefly on some aspects of the fluid problem in burns.

Ideal fluid therapy would entail replacement at the same rate as loss. Seldom is this accomplished. The greatest loss of fluid is during the first few hours after the burn has been sustained, not during the hours after therapy has started. As a result, a patient seen several hours post-burn is in a great deal of trouble already and much less time is available during which to administer the required fluids to prevent shock.

Calculation of required fluids is important, but perhaps more important is the administration of fluids on schedule. Deficiency states may develop quickly—restlessness and disorientation, for example, are not indications for narcotic administration, but rather evidence for a need to intensify fluid replacement efforts.

One should not depend on oral intake in the badly burned patient, especially if a child, since so often electrolyte-containing fluids will be ingested eagerly only to remain in the poorly emptying stomach and be vomited several hours later.

In recent years the intravenous use of single, balanced solutions of water, glucose, sodium chloride and protein have been used with success. Such solutions theoretically replace these constituents simultaneously and have much to offer in place of alternate infusions of each. In a pinch, normal saline can be used alone with reasonable expectation of shock prevention.

Whole blood rarely is required in partial thickness burns. It is needed, however, when more than 20 per cent of third degree burn is present. This is especially important when flame has been the cause of the burn where there is immediate red blood cell hemolysis as well as a delayed hemolytic phenomenon seen also in other types of burns, probably due to increased red blood cell fragility. To what extent an elevated hematocrit contraindicates use of whole blood has not been established. Red blood cell deficits and hemoconcentration can co-exist frequently because water and electrolytes are lost in greater quantity than red blood cells. Under these conditions, whole blood should be given simultaneously with electrolyte solutions. The need for whole blood is greatest in the patient with deep, extensive burns who shows signs of peripheral circulatory collapse with low or normal hematocrit values, and who has failed to respond to electrolyte and colloid solution administration.

Recent autopsy studies have demonstrated previously unrecognized changes apparently associated with overexpansion of the blood volume, especially by whole blood transfusions and colloid solutions. Thromboembolic phenomena, pulmonary edema with membrane formation, urinary tract infection and necrosis appear to be related to increased viscosity of blood in burns and excessive fluid administration with dangerous hypervolemia. Monitoring of peripheral venous pressure may be one way to detect when the problem of expanded blood volume may appear.

All of the mechanical and pharmacological methods that have been suggested to decrease the abnormal capillary permeability in burned tissues have failed to influence the loss of fluids. Compression, for example, merely translocates the losses from the wound to surrounding tissues. Although adrenocortical steroids alter capillary permeability in inflamed tissues, they have been ineffective experimentally and clinically in limiting protein leakage from capillaries in burned tissues.

Many articles have appeared in the medical literature during the past three years regarding the use of osmotic diuretics such as urea or mannitol to prevent renal shutdown. Such solutions must be administered carefully to avoid hypernatremia problems. Much more study of their effect is indicated before they can be recommended for routine use.

The critically burned patient can get into serious trouble 3 to 12 days after trauma. During this period serum sodium seems to be a better indicator for therapy than urine volume. Enough water must be given to keep the serum sodium under 150 miliequivalents per liter. A level higher than this causes withdrawal of cellular water into the interstitial space with subsequent cellular dehydration and death. When the diuretic phase develops and the sodium which has been given during the first 48 hours is mobilized and excreted, attention again must be focused on keeping the serum sodium at normal levels, 135 meq./L.

In summary then, fluid problems in the burned patient are poorly understood at this time. Nonetheless, careful attention to the problem with therapy as effective as can be managed with our limited knowledge will allow many burned patients to survive who certainly would have died a few years ago during the early post-burn period.

Dr. Atkins: The one point of agreement on the topic of septicemia and burns is that this is a problem of paramount importance. One-third to two-thirds of the deaths which now occur in burned patients are due to septicemia. In a series of 596 patients with burns studied at the Brooke Army Medical Center from 1954 to 1959, one-sixth had septicemia. However, this complication accounted for nearly two-thirds of the total deaths, representing a four-fold increase in the proportion of deaths to incidence of septicemia. Even more grim evidence for the seriousness of this problem is the fact that only one-fifth of those with septicemia survived. The problem in burns is quite simply to prevent septicemia before the granulation barrier is established, but this is obviously more easily stated than solved. There are a number of questions which should be considered in seeking an answer to this problem. Is the burn surface originally sterile, as had been stated occasionally, or is this an initially contaminated area? There now appears to be virtually unanimous opinion that preexisting microorganisms persist even in areas subjected to third degree burns, so that all burn wounds must be considered contaminated from their onset. Most studies have demonstrated that the period of the greatest danger from sepsis is generally between the third and tenth day after the burn. Thereafter, deaths due to septicemia fall off markedly. What factors lead to mortality due to infection? Technical problems, such as the open versus closed methods of treatment, are apparently not involved. However, mortality is definitely associated with both the area and depth of the burn, factors which would be expected to correlate directly with the extent of the infection established at the burn site and hence responsible for septicemia. The blood stream itself has a very rapid and effective clearance mechanism so that persistent bacteremia indicates a continual extravascular source feeding organisms into the circulation.

The next question deals with incidence of various types of microorganisms on the burn wound surface. Over the five-year period in the Brooke series, which is similar to others. Staph. aureus occurred in one-third to two-thirds of the cultures; Pseudomonas in 40 to 80 per cent; proteus in 15 to 50 per cent and beta-hemolytic Streptococci considerably less, with incidence of 6 to 20 per cent. These, however, are total cultures and, therefore, weighted in the direction of the long-term survivor. No figures are given for initial cultures before institution of therapy nor are they correlated with such factors as time postburn or type and duration of antibiotic treatment. Answers to these questions are not available in these studies, and have not apparently been given sufficient attention in other reports. The microorganisms which are most frequently associated with mortality appear to be Staphylococcus and Pseudomonas which in pure or mixed culture accounted for eighty-six per cent of those dying with septicemia in the Brooke series. However, during the five year period between 1954 and 1959, the incidence of Staphylococcus as the causative organism fell from 75 to 31 per cent whereas in the same period Pseudomonas increased from 42 to 63 per cent. An ominous factor is the fact that there were no survivors with Pseudomonas septicemia. The clinical characteristics of this disease are quite striking though not diagnostic and are probably due to the endotoxin which is produced by Pseudomonas like other gram-negative bacteria, rather than to the invasiveness of the organism itself. A most important question here is whether this increased incidence of Pseudomonas septicemia is related to previous antibiotic treatment. Conversely, how many people are surviving because of effective antibiotic treatment directed largely at other organisms? There is good evidence that certain burn wounds are contaminated with beta hemolytic Streptococcus, an organism invariably sensitive to penicillin which is almost invariably given early. Perhaps a significant number of patents survive because they either have or would have had septicemia due to bacteria which are eradicated by early institution of antibiotic therapy. Is such therapy simply selecting out a small group of patients who cannot be saved because they are initially infected with one of these resistant organisms or do these bacteria appear on the burned surface following systemic therapy which the patient is receiving? There are no clear answers to these questions and yet they are needed in order to plan rational antibiotic therapy. It would be valuable to study in an appropriate experimental animal the sequence of bacteria which appear on a burn site, both with and without the institution of various antibiotic regimens. In this way it might be ascertained whether septicemia with Pseudomonas or other gram-negative bacilli is a consequence of prior antibiotic therapy or whether an equal percentage of animals develop this complication without antibiotic therapy, in which case it would certainly be justifiable to treat promptly those infections which can be eradicated.

Since antibiotics are almost always given early, there are little or no data on what the results would be if they were not used. This is probably justified at least for the first few days because of the impressive number of deaths occurring in some series due to beta hemolytic Streptococcus septicemia. Supplementation of systemic therapy with antibiotic creams applied locally seems a reasonable point of view and has achieved some success in England. There is, of course, no question that late specific antibiotic treatment based on the blood and/or wound cultures should be given and yet, as pointed out, it is often done with little or no success when the causative organism is one of the common gram-negative pathogens. Stated differently, the real problem is whether there are means of preventing the development or overgrowth of Pseudomonas and similar antibiotic-resistant organisms in burn wounds. If these bacteria are originally present in mixed cultures, should antibiotics be withheld so that these organisms will compete with perhaps less toxic organisms which may prevent them from growing in pure culture and elaborating large amounts of endotoxin for which there is no specific treatment? It should be emphasized that sterilization of any open wound is impossible with antibiotics—the best that can be hoped for is supression of sensitive flora.

With this in mind, it would seem advisable to give an initial short course of penicillin specifically aimed at Streptococci and sensitive Staphylococci. Following this, serial cultures of the burn surface should be obtained and the patient closely observed for signs of sepsis, admittedly often difficult to distinguish from those due to nonspecific inflammation. However, some signs such as hypotension, jaundice, and certain hemorrhagic skin lesions are typically associated with bacteremia with gram-negative organisms, especially Pseudomonas. When the clinical picture suggests sepsis, especially during the period of greatest hazard (from about the fourth day through the second week), vigorous systemic antibiotic therapy should be instituted without delay based on results of cultures from the burn wound. In general, wound and blood cultures correlate well and it would be hazardous to delay for confirmation by blood culture under these conditions. Other short courses of specific therapy might be given at the time of extensive debridement or grafting procedures. It appears that Staphcillin and other synthetic penicillin analogues may be of great help in controlling infections due to Staph. aureus, the other major organism implicated in postburn sepsis, but it should be emphasized again that there is at present no certain answer to the problem of preventing Pseudomonas septicemia in burns. Finally, the absolute necessity for so-called "reverse precautions" and rigid enforcement of techniques of asepsis as an adjunct to antibiotic therapy should be stressed in the management of all such patients.

Dr. Shedd: Dr. Atkins has covered the problem of the massive infection, and I think it is *the* major problem. He mentioned a figure of 60 per cent for infection as the cause of death in the massively burned patient, and it actually exceeds all other causes in its magnitude.

What is the pathology of the infection under discussion? Unfortunately there is not a great deal known about this. George Pack, whom some of you know in another context did some work on this subject at Yale around 1931 and some of what we know about the actual pathology of the burn wound infection is in his book. Studies by Price have indicated that one of the things that takes place from the massive amount of tissue infected, both in depth and in surface area, is that there is early invasion of regional lymph nodes, and secondary to this, massive invasion of the blood stream. With this burn septicemia or bacteremia, there goes a rather characteristic clinical picture, a picture manifested by extreme fever, tachycardia, disorientation, and paralytic ileus. Some of the authorities feel justified in instituting aggressive antibiotic therapy on the basis of this clinical picture alone before the cultures become available. It has been indicated that the survivorship of this burn bacteremia is under 20 per cent. It should perhaps be further expanded that this survival group is comprised primarily of healthy young adults whose burns are in the order of 40 per cent or less, not the 60 per cent group. So this is a very select group of people who survive the bacteremia, and it is those whose organism is not Pseudomonas. What can be done to make sure that some of the septicemia patients do survive? The answer to this question is that not very much beyond the antibiotic therapy is available. It would seem from experience with small area burns that aggressive debridement measures amounting to excision of the burn would offer a great hope in minimizing the infection problem. Actually, the excision and early debridement of small area burns is quite a useful measure. It is particularly applicable to the hand, but when this aggressive surgical approach is applied to massive area burns and it has been by a few brave clinicians, the results have not been gratifying. The Brooke group did not mention the radical debridement procedure in their most recent writings. I have the impression from their experience and the experience reported by a Hungarian surgeon named Frank that the mortality that accompanies the aggressive debridement approach is high enough to make it have a very limited place. Frank has utilized as adjuncts in his aggressive debridement hypothermia and artificial hibernation, and even with these adjuncts, he reported a high mortality. It may be that in some future day, adequate local surgical care of the wound will be an important part of the management of the septicemia problem, but right at the moment its place is difficult to establish. In the patient who was shown, the manner of debridement was very conservative, scraping of wound rather than actual debridement, the reason for this being that in the radical aggressive debridement, tissue barriers are opened and it may be that the infection problem can be increased rather than decreased by these efforts. I have deliberately omitted any reference to differences between exposure versus occlusive dressings in the care of the burned wound, because I am not sure that there is any evidence that these are significant in relation to the infection problem. My concluding comment would be to emphasize the vast area of unknowns in the problem of the infection in the burned patient, areas which remain to be elucidated by further clinical and experimental investigation.

Dr. Chase: I think it is probably appropriate that the management of the burn wound *per se* is left until last. In terms of the patient's early survival, the parts of this discussion which were already heard are most important and we should pay least attention to the burn wound except to keep it as sterile as possible during the early phases of burn treatment. The aims of burn therapy are extremely simple; to get rid of burned dead tissue residing on the external surface of the body and to cover the wound with new living skin. In theory this is extremely simple but in practice it is one of the most difficult things that we as surgeons have to face. What I am going to talk about is timing in the management of the burn wound. The early aggressive approach to burn therapy should be reserved only for the burned patient who has a small burn, perhaps 15 per cent or less. There is one mandatory reason, however, for early intervention in the burn wound. An example is the patient in whom there has been a circumferential third degree burn of an extremity which has resulted in complete destruction of circulation to the periphery by its tourniquet effect. In these instances, incisions down the side of the burn wound if they are done early enough can conceivably achieve survival of the lower extremity. The acute burn with incomplete skin coverage creates a tremendous problem. We must get this patient covered with skin early before he becomes a chronic burn with an open wound and with all the resulting problems that do occur including immediate malnutrition and finally graft failure with donor site breakdown and a vicious circle of events that finally results in a late mortality. One of the techniques that has been used to evaluate granulation tissue and decide whether or not it is time for grafting is to use nitrazine paper. If the wounds are alkaline in their response, the recipient site is theoretically ready for grafting. Actually, in carrying out a study on this problem, it was quite easy to predict which wounds would be ready without the use of nitrazine paper, we were always able to predict by looking at the wound whether it would be alkaline or acid. The technique that I think is extremely useful in covering large area burns is the postage stamp technique applying widely spaced postage stamps of thin, split-thickness skin to the areas of severe burns. What happens to these postage stamps? By the fifth postoperative day, they have usually taken and around them is a halo of newly growing epithelium. Before long there is a coalescence of the epithelium between these stamps to achieve skin coverage and that, of course, is our primary aim in the early burned patient.

Just one word about the priority areas which should be considered in early coverage of the burn. Concentrate on the face, the axillae, the hands, and the joint areas in order to avoid the severe contractures that do occur. I say concentrate, but don't be carried away by this and waste skin to cover the areas because the most important single factor in covering the burn is to achieve a closed wound without emphasis on the later rehabilitation of the patient. Once the wound is closed, we can always turn back the clock in terms of mobilization of joints, etc. Here is a little trick in obtaining skin from a difficult site, the chest wall. If you fill out the intercostal valleys by subcutaneous injection of normal saline, it is possible to achieve a nice flat surface from which one can obtain thin split-thickness skin in this manner.

Early coverage of these wounds can be summarized by saying there are times for the surgeon to be aggressive but there are times that the surgeon must rein in his enthusiasm. For the surgical treatment of the burn, the primary aim of treatment is to achieve a closed, healed wound without attention to the cosmetic result, without attention even to the functional result, but with an aim to saving the patient's life and avoiding the chronic burn. Then in sequence comes time for the surgeon to rein himself in to allow the patient to regain a good nutritional status, to allow his wounds to mature after which the reconstructive procedures can be carried out for functional and finally cosmetic restoration.

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SUMMARY OF ACTIONS OF THE HOUSE OF DELEGATES CONNECTICUT STATE MEDICAL SOCIETY

New Haven, Connecticut

December 4, 1962

REPORTS

Officers

The House of Delegates received informal reports and remarks from the following:

Clyde L Deming, New Haven, President
Morris P. Pitock, Bridgeport, President-Elect
Orvan W. Hess, New Haven, Secretary

The House of Delegates received formal reports from the following:

Isadore S. Goldberg, Torrington, Treasurer. Dr. Goldberg reviewed the recommended Budget for 1963, pointing out significant changes in appropriations and expenditures in the 1963 Budget as compared to the 1962 Budget.

Max Caplan, Meriden, AMA Delegate. Dr. Caplan reviewed the highlights and significant actions taken by the AMA House of Delegates at its Annual Meeting in Chicago, June, 1962.

Norman H. Gardner, East Hampton, AMA Delegate. Dr. Gardner reviewed the highlights and significant actions taken by the AMA House of Delegates at its recent meeting in Los Angeles, November 25-28, 1962.

Chairman Of The Council

Ralph L. Gilman, Storrs, Chairman of the Council. Dr. Gilman reported on the major activities of the Council since the Annual Meeting of the House of Delegates in Hartford, May 1, 1962. His written report is published at the end of this summary.

General Manager

William R. Richards, New Haven, General Manager. Dr. Richards presented a review of some of the political and socio-economic pressures which are currently threatening to seriously alter or eliminate the private practice of medicine His written report is published at the end of this summary.

OLD BUSINESS

Proposed Amendments To The Bylaws

It was VOTED to remove from the table and act upon four proposed amendments to the Bylaws, introduced at the meeting of May 1, 1962 and tabled until this meeting, December 4, 1962. The proposed amendments and the actions taken thereon follow:

1. Introduced by the Council: That Article V, Section 2, of the Bylaws be amended by the addition of a new subsection (c) which shall follow immediately after present subsection (b) and shall read: "ALL PAST PRESIDENTS OF THE SOCIETY, WHO SHALL BE EX-OFFICIO MEMBERS OF THE HOUSE OF DELEGATES, WITHOUT THE PRIVILEGE OF VOTING."

Action: It was voted to adopt the amendment.

2. Introduced by the Litchfield County Medical Association: That Article VII, Section 1, Paragraph 7 of the Bylaws be deleted and substituted therefor by the following: "THE CHAIRMAN OF THE COUNCIL AND THE COUNCILOR FROM EACH COUNTY SHALL BE THE NOMINATING COMMITTEE OF THE SOCIETY. THE CHAIRMAN OF THE COUNCIL SHALL BE THE CHAIRMAN OF THE COMMITTEE. THE COMMITTEE, AFTER CONSULTATION AND ADVISING WITH THE ENTIRE COUNCIL, SHALL REPORT ITS NOMINATIONS TO THE FIRST SESSION OF EACH ANNUAL MEETING OF THE HOUSE OF DELEGATES. FOLLOWING THIS REPORT, NOMINATIONS MAY BE MADE FROM THE FLOOR."

Action: A motion to adopt this amendment was defeated.

3. Introduced by the Litchfield County Medical Association: That Article VII, Section 2, of the Bylaws be amended by the deletion of the clause: "AND ONE ADDITIONAL ASSOCIATE COUNCILOR FROM EACH COMPONENT ASSOCIATION HAVING OVER 750 MEMBERS."

Action: A motion to adopt this amendment was defeated.

4. Introduced by the Litchfield County Medical Association: That Article VII, Section 2, of the Bylaws be amended by the addition of the sentence after the term Councilor-at-Large: "IN THE EVENT THAT BOTH THE COUNCILOR AND THE ASSOCIATE COUNCILIOR (S) FROM A COUNTY ASSOCIATION CANNOT BE PRESENT AT A COUNCIL MEETING, THE PRESIDENT OF THE COUNTY ASSOCIATION MAY APPOINT A SUBSTIUTE COUNCILOR."

Action: It was voted to adopt the amendment.

New Business And Reports Of Reference Committees

a. THE 1963 BUDGET

It was voted to approve the Budget for 1963, as recommended by the Council, including the fixing of annual dues for 1963 at $40.00.

b. SECTION ON NEUROLOGY

It was voted to approve the formation of a Section on Neurology, as recommended by the Council.

c. RESOLUTION NO. 1—"DEFINITION OF CERTAIN CSMS POLICIES ON DOCTOR-CARE AND ITS FINANCING."

With very minor amendment, as approved and recommended for House adoption by the Council, it was voted to adopt Resolution No. 1 as printed in the agenda. The text of the Resolution follows:

WHEREAS: It frequently appears that there is confusion in the public mind, and even among physicians, as to the precise meaning and significance of certain commonly used terms relating to doctor-care and its financing, and

WHEREAS: In the face of accomplished and proposed alterations in the socio-economics of the American system of medicine, several of these terms are greatly in need of more exact definition, therefor be it

RESOLVED: That the House of Delegates of the Connecticut State Medical Society define certain basic policies relating to doctor-care and its financing as follows:

1. THE PATIENT-PHYSICIAN RELATIONSHIP: It is the policy of the Connecticut State Medical Society that each of the two parties to the traditional patient-physician relationship has certain direct responsibilities to the other. *The physician* is personally responsible for informing the patient as to his condition of health or disease; for prescribing and/or carrying out a course of appropriate treatment, where indicated; and for advising the patient or his legally-liable relatives as to what the physician's professional charges are or will be for the service he has rendered or proposes to render. *The patient* is personally responsible for accepting, rejecting or discontinuing the physician's advice and/or treatment; and for payment of the physician's fee agreed upon or appropriate to the professional service rendered to him by the physician. Each party must have freedom to choose the other, and each must have the right to take recourse against the other, should the occasion arise.

2. THE PHYSICIAN'S FEE: It is the policy of the Connecticut State Medical Society that each licensed practitioner of medicine possesses the inalienable right to determine for himself the fee he will charge for each professional service he renders to his patients; and, by the same token, that each licensed practitioner who is a member of the Society has a personal responsibility to explain the amount and nature of his fee to all parties legitimately concerned with the rendering of a service, as determined by professional bodies of the Society or its component county medical associations which are authorized to review and evaluate both his performance and his charges.

3. THIRD PARTY PAYMENT: It is the policy of the Connecticut State Medical Society that when a third (insuring) party proposes to compensate a physician, in part or in full, for a service he has rendered to a patient under his care, all terms of the contract under which a *direct* payment of this nature is to be made to him must be satisfactory to the physician as well as to the patient. Pursuant to this policy, the Society holds that it lies entirely within the discretion of each individual practitioner whether he accepts any third party compensation as "in part" or "in full" payment of his fee for a service he has rendered, unless he has waived this discretion by entering into a prior agreement with the third party agency concerned, and except that, if he is a member of the Society, his individual discretion as to fees is subject to review and evaluation as outlined in Item 2 (The Physician's Fee).

4. "SERVICE BENEFITS": It is the policy of the Connecticut State Medical Society that the term "Service Benefits" shall mean that, through the medium of insurance or prepayment mechanisms, a participating physician guarantees to provide to certain persons enrolled in such plans certain specified doctor-care services; and further agrees to voluntarily accept fixed, reduced or substandard compensation for those services to those persons in lieu of his normal or usual fee; and further agrees that, should the plan encounter financial difficulties, he will continue to provide all covered services to eligible enrolled members for the life of their contracts whether he receives any compensation for the services or not. The entitlement of persons enrolled under such plans to receive "Service Benefits" protection is determined primarily on the basis of annual income, an upper limit of annual income being specified as an integral condition of enrolled members receiving "Service Benefits" from participating physicians. Pursuant to this policy, it is the opinion of the Society that, acting with the consent of a majority of its members, the House of Delegates is entitled to exert substantial influence on, if not actually establish, the levels of income for "Service Benefits" eligibility prevailing under any and all third party agencies *which are sponsored and/or approved by the Society*. This policy precludes the assumption of authority by individuals or agencies functioning outside the Society and/or a third party agency *which it approves or sponsors*,

to limit or extend the scope of "Service Benefits," either by unilateral action or by other more indirect methods, and be it further

RESOLVED: That the House of Delegates of the Connecticut State Medical Society, in taking further actions designed to benefit the public health and welfare and to preserve the free system of American medicine, shall adhere to and be guided by the policies defined and set forth in the previous RESOLVED of this Resolution.

d. RESOLUTION NO. 2—"INCREASING THE AVAILABILITY OF 'SERVICE BENEFITS' PREPAYMENT PLANS."

As approved and recommended for House adoption by the Council, it was voted to adopt Resolution No. 2 as printed in the agenda. The text of the Resolution follows:

WHEREAS: On July 22, 1958, the House of Delegates of the Connecticut State Medical Society adopted a Special Committee Report which recommended, in part, that the Council be empowered to investigate the desirability of developing a standard Service Benefits-Indemnity prepayment contract which, with Society approval, could be offered for sale by "any, various or all private insurance carriers licensed in Connecticut," and

WHEREAS: Subsequent to July 22, 1958, as a result of its investigations, the Council concluded that the development of such a contract was not advisable *at that time,* and

WHEREAS: The House of Delegates has affirmed and re-affirmed its support of the Service Benefits principle as a worthy adjunct to doctor-care financing, particularly as its broad application affords independence and dignity to people in modest or reduced circumstances, and

WHEREAS: In the Opinion Survey Report of 1961, 70% of private practitioners responding indicated they would favor having the Society give official approval to private insurance plans which were "in strict conformance with standards set by the Society," therefore be it

RESOLVED: That the House of Delegates of the Connecticut State Medical Society again direct the Council to explore all methods by which "Service Benefits" prepayment for doctor-care can be made available to the largest number of lower-income families and individuals in Connecticut, such exploration to include, but not be limited to, the following:

1. The feasibility of the Society developing or having developed a "model" or "standard" Service Benefits prepayment contract, of which the payment schedules, types of coverage, qualifying income limits and other pertinent features would be subject to final determination by the House of Delegates.

2. The advisability of permitting such a Society-approved, standard, Service Benefits prepayment contract to be offered for sale by any, various or all licensed insurance and prepayment carriers in Connecticut, such permission to be granted separately to each carrier by the House of Delegates or its designated authority within the Society.

3. The desirability of developing a 100% Service Benefits contract within the income limits prescribed by the House of Delegates, as against the desirability of also including an "indemnity" feature for those policyholders who do not qualify for "full-pay" coverage on the basis of income.

4. The practicability and/or legality of enabling physician members to enter into a single agreement of participation with the Society for *all* Service Benefits contracts approved by the House of Delegates, as contrasted with each physician member entering into a separate agreement of participation with each agency selling a Society-approved contract.

5. The need for establishing central or county-dispersed "review committees" to adjudicate contested or unusual claims against Society-approved contracts.

6. Questions pertaining to the non-cancellability of contracts, group vs individual enrollment, conversion and retention of coverage after retirement, and other related matters, and be it further

RESOLVED: That the House of Delegates authorize the Council to confer with and/or engage such technical assistants as may reasonably be required, in order that a comprehensive report on this undertaking will be presented to the next regular meeting of the House of Delegates.

e. RESOLUTION INTRODUCED FROM THE FLOOR BY DELEGATE CARL BUTENAS, MERIDEN (N.H.). After voting *not* to accept a resolution introduced by Dr. Butenas for consideration and report by a Reference Committee, it was voted to refer the resolution to the Committee on Third Party Payments for study and report to the Council.

The resolution read as follows:

RESOLVED: That the House of Delegates of the Connecticut State Medical Society urge CMS, Inc. to include a surgical assistant's fee in the CMS payment schedule, based on 20% of the surgeon's fee.

f. RESOLUTION INTRODUCED FROM THE FLOOR BY DELEGATE JACK H. GALEN, DERBY (N.H.). It was voted to accept the resolution introduced by Dr. Galen for consideration and report by Reference Committee "B", consisting of Jack H. Galen, Chairman; Louis Guss; Clarence W. Harwood; J. Brooks Hoffman; and Waldo B. Martin.

Subsequently, it was voted to adopt a resolution recommended to the House of Delegates in its report by Reference Committee "B", as follows:

"WHEREAS: ETHICAL TELEPHONE LISTING IS A PART OF THE PRESENT-DAY CODE OF MEDICAL ETHICS, THEREFORE BE IT

RESOLVED: THAT ALL PHYSICIANS IN CONNECTICUT LIMIT THEIR 'YELLOW PAGES' TELEPHONE LISTINGS TO THAT TELEPHONE DIRECTORY, OR THOSE TELEPHONE DIRECTORIES, WHICH COVER THOSE EXACT LOCATIONS IN WHICH THE LISTING PHYSICIANS EITHER MAINTAIN THEIR OFFICES AND/OR RESIDENCE, OR WHERE THEY MAINTAIN ACTIVE HOSPITAL AFFILIATION (S) ."

It is assumed that all members of the Society will be guided by the meaning of this resolution, subject to individual review and interpretation of their telephone listings by an appropriate committee of the constituent county medical association in which they hold membership.

REPORT OF THE CHAIRMAN OF THE COUNCIL

Mr. Speaker, Mr. President, Members of the House of Delegates:

During the months since the annual meeting of the House of Delegates, the Council has held seven regular meetings with the usual very high attendance of the members. You have received prior to this meeting the agenda which contains a number of items that are being recommended by the Council, namely, (1) the annual budget and dues necessary to meet the budget; (2) the formation of a section on Neurology; (3) changes made in the divisional Boards and Committees, and (4) the two somewhat lengthy resolutions. I shall not comment on these matters in this report as your discussion of them will rightly come during this meeting.

Under the new By-Laws, provision was made for the category of "Life Members". The Council has approved a form for applicants for this life membership to file with the General Manager so that information to certify the requirements for becoming a life member will be on file. Eleven members have applied for and been granted life membership.

In September, a Congress on Quackery was held which, by all reports, was very successful and well attended. Dr. Max Caplan was the Chairman of the Advisory Committee which organized the program, and he submitted the plans for approval during its development and received the full approval of the Council.

After considerable discussion of the merits of leasing vs. purchasing a new car for the Society, the Committee on Building Management was finally authorized to purchase the car under a top-price ceiling. This has been accomplished.

Upon recommendation of a special committee of the Council, it was voted, in May, to establish a Committee on Medical Education and Hospitals composed of the delegates and alternate delegates to the AMA and a member from the Society's Committee on Hospitals and the Society's Committee on Post-Graduate Education. The purpose of this Committee is to establish and maintain liaison with the AMA Council on Medical Education and Hospitals in the consideration, particularly, of the intern and residency programs. The composition of the Committee at present is:

James R. Cullen, Chairman
Norman H. Gardner
Max Caplan
Vincent A. Gorman
Stewart P. Seigle
John H. Grossman
Howard J. Lockwood
John C. Leonard
(Marvin Lillian, alternate to Dr. Leonard)

The Council adopted, and has directed the Society's Delegates and Alternate Delegates to the AMA to file and support, two resolutions: 1) on the question of Third Party Agencies and Patient Care; 2) on intern quotas for accredited hospitals. In addition, the Delegates have been urged to support a plan for compensation of interns and residents which would put into the hands of the Medical Staff of a hospital the control and management of monies accruing to licensed members of the Residence Staff from individuals or third parties for surgical or other professional services performed by House Staff members for staff or ward patients. These matters were to be introduced at the AMA House of Delegates session which has just concluded, and it may be that our delegates can report at the proper time today on the outcome.

The Annual Meeting of the Society will be held April 30 to May 2, 1963 at the Hotel Statler in Hartford, with full expectation that the Session will be at least as successful as the meeting last May. Under the rotation of location for meetings of the House of Delegates which had been established, it was the turn of Fairfield County to be the host to the House of Delegates. The Board of Governors of Fairfield County graciously relinquished this right in order that the entire meeting could be conducted at one location. It might be advisable to amend the schedule of rotation so that only the semiannual meetings will come under it. It would seem only logical that the Annual Meeting of the House should be held in the same location as the Scientific Session.

In September, the Council, on recommendation of the Committee on State Legislation, appointed an Ad Hoc Committee on Animal Research whose purpose is to "effectively organize and focus support for sound animal research legislation among the physicians of the State". The membership is as follows:

Averill A. Liebow, Chairman
Roy N. Barnett
Edward L. Howes
James W. Major
Louis H. Nahum
Jasper A. Smith
Frederick J. Fagan

It is expected that this Committee will also work cooperatively with the Committee on State Legislation during the forthcoming Session of the General Assembly.

On April 15, 1962, the Kerr-Mills legislation for medical assistance to the aged became activated in Connecticut under legislation passed by the previous General Assembly. During the following months, a number of inquiries concerning how this program was being handled and how effectively it was functioning were received by the General Manager. An Ad Hoc Committee was established by the Council to interview Commissioner Shapiro and Dr. Edwin Connors, Medical Director of the State Welfare Department. The membership was:

Ellwood C. Weise, Sr., Chairman
William Gatlin
Jack H. Galen
Harold D. von Glahn
Arnold Jantzen
Max Caplan
Stevens J. Martin
John R. Egan
William R. Richards

Before meeting with the Commissioner, the Committee compiled a list of questions for the purpose of an orderly presentation of the points they wished to have answered. This Committee has made a detailed report to the Council, copies of which are being furnished to our Legislative Committees for study so that they may consider the introduction of any amendments that may seem necessary to make the program more effective for those it is primarily supposed to serve. The report indicates that the biggest item of MAA expense has been incurred by the mass transfer of all Old-Age Assistance recipients residing in convalescent or chronic hospitals to the MAA program. Applications for medical aid were not processed very rapidly during the first three months, but now are being processed essentially within the sixty days required by law.

Throughout the months since the last meeting of the House of Delegates, the whole question of the corporate practice of medicine has occupied a considerable amount of time in Council discussions. In May, it was voted to engage the services of Mr. Edward L. Marcus of New Haven to make a thorough study and report. A committee of the Council was appointed to receive Mr. Marcus' report and to discuss it with him. The committee, consisting of James R. Cullen, Clifford Wilson, David Grendon, Frank Abbott and Michael A. Dean, reported its findings and recommendations to the Council at the November meeting. The details of Mr. Marcus' report are much too lengthy to include in this report. The subcommittee and the Council feel that he made a very exhaustive study, both from the standpoint of legislation and legal opinions. One of the conclusions is that there is no clear cut evidence that the so-called corporate practice of mediine is either legal or illegal. Another conclusion is that a "test case" would have to be instituted in the courts, or in the legislature by introduction of specific legislation on this point in order to get a firm basis on which to settle this question. Both avenues have certain dangers and pitfalls that must be recognized, and one of his recommendations is that it would be very wise to secure, if possible, definite assurance that a considerable majority of the members of the Society wish the Council to initiate such action and will wholeheartedly support it. The Council is fully aware of the fact that there are differences of opinion even among and within the groups most directly concerned with this problem, namely, the radiologists, the anesthesiologists, the pathologists and the physiatrists. Because of these factors, the Council has requested each County Association to call a special meeting of their members to consider this question and make whatever recommendations they see fit for the guidance of the Council. The Council also hopes that the above-named groups will be able to indicate, in no uncertain terms, what they feel should be done and, more important, what active support they will give if called upon. It would be confusion worse confounded to initiate any action if, during the course of it, it bceame apparent that a sizeable proportion of the membership were not willing to stand behind such action.

A special meeting of the House of Delegates was held on July 19, 1962 at which time it was voted not to approve the proposed Amendment to the Preferred Contract of Connecticut Medical Service. You will recall that, following this vote, I introduced a draft of a statement incorporating alternate proposals for submission to C.M.S. for their consideration. Subsequent to the receipt of these proposals, the Board of Directors of C.M.S. failed to approve a proposal to make this proposed Amendment effective and requested the Council to meet with them as promptly as possible for a complete discussion of the Amendment to the Preferred Contract. This meeting was held August 23, 1962 in the Board room of C.M.S. Twenty-one members of the Council attended. Dr. Horton, the Executive

Director, had prepared and presented an outline of what it would cost to carry out these suggestions submitted by this House and concluded that actuarily it could not be done. It was the definite feeling of the members of the Council that this matter was presented on an "all or nothing" basis. Requests for an outline of what part of the suggestions could be incorporated within sound actuarial requirements elicited no response at that meeting nor since.

Under date of October 3, a letter from Dr. Horton to me, as Chairman of the Council, was received, informing me of the action of the Board of Directors at a special meeting held October 2, as follows:

> It was duly moved, seconded and voted unanimously: It is the opinion of this Board of Directors, after discussion with the Administration and reviewing proposals for an Amendment to the Preferred Contract, that any change in benefits in the Preferred Contract without an increase of Service Benefit levels is not feasible at this time and this Board wishes it to be so recorded and the Council of the Connecticut State Medical Society so informed.
>
> Following this, it was duly moved, seconded and voted:
>
> That the Board of Directors hereby authorizes the Amendment to the Preferred Contract, as approved on February 8, 1962, to be made effective as soon as possible, subject to the approval of the Insurance Commissioner, and instructs the Executive Director to present promptly to the Insurance Commissioner the Amendment to the Preferred Contract for his approval.

A subsequent communication from Dr. Horton, under the date of October 30, stated that the first motion was not voted unanimously since one physician had requested that he be recorded as voting in the negative. A meeting of the Council was held on Sunday, October 14. The physician members of the Board of Directors were invited to attend and seven of them did. A prolonged discussion was held and the expression of various points of view were made. The Chairman is aware that some of the physician members of the Board of Directors felt that they had not been given sufficient opportunity to express their views although there was no intention to slight them. It was finally voted to send to Mr. Premo, the Commissioner of Insurance, a detailed statement of the Society's position in voting not to approve the Proposed Amendment to the Preferred Contract. This letter also outlined, fully, the proposals submitted to C.M.S. by this House. Mr. Premo promptly acknowledged the receipt of this letter and stated that he wished to give it "much time, thought and consideration before giving a decision". On November 7, Mr. Premo wrote that he was "reluctantly approving the Amendment to the Preferred Contract".

C.M.S. has now, by unilateral action, made a major revision of an existing contract. In my reply to Dr. Horton, on receipt of his letter informing me of the action of the Board of Directors, I stated, "What all this means for the future relationship between the Connecticut State Medical Society and Connecticut Medical Service, I would not venture to predict".

Mr. John Coolidge, President of Connecticut Medical Service requested, through Dr. Deming, our President, that C.M.S. be furnished a copy of the Council's letter to the Commissioner on the basis that "I am sure you realize that any communication between the Council and the Commissioner with respect to the Amendment to the Preferred Contract is of vital interest to all of the members of the Board of C.M.S."

I have tried in this report to summarize as clearly as possible what I would consider the most important actions of the Council since your last meeting.

Respectfully submitted,

RALPH L. GILMAN, M.D.

December 4, 1962

REPORT OF THE GENERAL MANAGER

MR. SPEAKER, MEMBERS OF THE HOUSE, AND GUESTS:

It is exactly one month since Election Day and time, I think, for physicians to seriously take stock of what transpired during the recent political campaign and a long, hard look at what effect the assumption of Federal office by those who were victorious in Connecticut is likely to have on the future of American medicine. And time also, I believe, to analyze carefully certain other samplings of the unstable atmosphere presently surrounding the private practice of our profession.

As to politics, irrespective of our individual party affiliation and whether we consider ourselves to be liberals or conservatives, the very cold and ominous fact faces each of us that, with but one exception—Mr. Sibal, every single legislator who will represent our state in the 88th Congress and for some time thereafter is an avowed proponent of so-called "medicare". It matters little which of those elected turn out to be more or less competent statesmen and which turn out to be only political hacks. To a man, they made it crystal clear during their bids for office that they will vote for any medical care scheme the Administration decides to come up with and will do so the first and every chance they get. To the members of the Society who bear the responsibility of attempting to influence national legislation—including myself—I offer heartfelt sympathy. It would certainly appear that there will have to be some extremely cold days in July before our views on medical and health matters are likely to get more than a curt acknowledgement from Mr. Ribicoff and most of his Democratic colleagues. Our newest senator has said that the medicare issue "cut him up" on November 6th but, since he has won election, those of us who talked with him privately during the campaign have good reason to suspect that his alleged wounds will heal quite rapidly and leave few, if any, scars on his legislative conscience. So, like it or lump it, our chances of remaining free from the threat of government control have certainly been anything but improved by the choices the people of Connecticut made a month ago.

Again on the subject of politics: This year—for perhaps the first time in their lives—a relatively limited number of our members tried to go somewhat beyond their customary practice of casting a vote on the first Tuesday after the first Monday in November as the sum total of their participation in politics. With considerable fear and trepidation—beset by doubt, apathy and inexperience on every hand—they joined together to try to take a more active part in civic life as a group than it would have been possible for them to take as individuals. The product of their creation, as many of you know, was COMPAC—the Connecticut Medical Political Action Committee.

It is not my purpose here to attempt to evaluate what and how much COMPAC was able to accomplish on its maiden voyage, nor to prognosticate what its future will or should be. I can only offer the personal opinion that those COMPAC members who were reasonably satisfied with the committee's performance should certainly continue to support it; that those who were more or less disappointed with its operation ought not to relinquish their membership but, instead, should try to increase its potential through active participation; and that the all-too-many physicians who decided to remain aloof from this initial venture of Connecticut medicine in politics would do well to reconsider their decision. COMPAC and its national counterpart, AMPAC, have been brought into being by doctors and they will obviously wither on the vine unless the vast majority of practitioners enthusiastically sustain and encourage the efforts of both toward preserving the free system of medicine and bettering the public health in America through concerted political action. Further, as I see it, unless COMPAC members in every community or area in the state are willing to actively organize and function locally, I doubt that a central committee, by itself, can be more than minimally effective.

It was my privilege—entirely as an individual—to sit in on a number of the interviews which COMPAC conducted among the candidates running for Federal office and, as a sort of fringe benefit of taking part, to meet face-to-face with some real, live politicians. I can report to you who did not have this opportunity that the experience was most rewarding but, having called it rewarding, I must hasten to add that it was sometimes frustrating, frequently discouraging and, in one or two instances, downright disillusioning.

When we ordinary citizens bother to examine a piece of campaign literature which bears a likeness of the office-seeker, we are usually inclined to conclude that he is rather distinguished-looking and imposing or, if not that, at least honest and sincere in appearance. If we take the time to read the deathless prose which purports to define his position on the issues, we may be deeply impressed with how wise he seems to be and how well-informed. But when we confront him in person—as some of us had the chance to do—in the privacy of a small room with the doors closed and the shades drawn, I can report in complete candor that his public image may turn out to be something quite different from the man himself. And when I say "different", I don't necessarily mean better!

There is no time now to offer you specific examples of this political phenomenon of split personality nor would it be proper for me to do so, since the interviews were conducted on a semi-confidential basis. But I can assure you that duality of image was not peculiar to the candidates of any one party. Granting that most physicians suffer somewhat from tubular vision on this medicare thing, and were therefore prone to favor those aspirants who claimed privately to agree with our view that a combination of voluntary health insurance and Kerr-Mills constitutes a positive alternative to compulsory Social Security medicine, we were nevertheless greatly taken aback and disappointed to find that, with almost no exceptions, these apparently kindred souls consistently failed to voice their agreement with us in public. As things turned out, they seemed anxious to discuss openly only such vital issues as whether the State Division of Fish and Game should become an independent agency or remain under the Agricultural Department's jurisdiction. Not a word about Kerr-Mills. Not a mention of voluntary insurance. And yet, on election night, some of these candidates—and they were the losers—joined with the winners on TV to congratulate each other on having "thoroughly discussed the issues with the people", and to commend the electorate for having made "informed decisions". I think the thoroughness with which the important medicare issue was discussed by *any* of the office-seekers and how well they informed the public is best exemplified in a letter received only last week from one of his readers by D. B. Gallagher, author of the syndicated newspaper column: "Social Security and You". A Mrs. L. S. wrote him: "Several of us older citizens (here) read your Social Security column, and are against the (President's) Medicare Bill. (I) wish the Kerr-Mills Law would be printed so people could see the difference between the two. . . . People have forgotten just what (Kerr-Mills) is and, of course, the Democrats don't help any. They are (only) after votes." The state in which Mrs. L. S. lives is not identified but, in my opinion, it could well be Connecticut. End of political report!

Oddly enough, these remarks on the wonderful and devious ways of politics do not bear directly on some even more important matters I would like to present for consideration by the delegates to this meeting of the House. What concerns me above all is the very real possibility that, through a highly dangerous combination of socio-economic ignorance and stultifying apathy, professional freedom will be surreptitiously stolen away from the private practitioner of medicine in America—as it has been in other lands, and without his even being aware that a robbery is taking place. It is true that the results of the recent elections may have served to awaken a few to some of the uglier facts of life, but it is not only the socialist-oriented politician and his associates who has set about engineering this major theft. There are literally a host of others—many of them cloaked in the respectability of the surgical gown and the laboratory apron—who are also trying to gain control of medicine and to acquire a monopoly on patient care, both public and private.

On the one hand, knowing full well who people like Mr. Ribicoff are and what they stand for, we can at least try to prevent or curtail the government regulation with which they seem bound to saddle us. But, on the other, what is the real extent of our knowledge of those who are operating far less forthrightly within the "medical family"; sometimes under our very noses? Are we giving enough concerted attention to the professional "fifth columns" which are infiltrating American medicine today? I don't believe we are. We have begun to do a little spade work, but I feel we need to go much deeper into this problem—and soon.

I am not proposing that doctors embark upon any witch hunt. There is nothing nebulous or imaginary about those who would sabotage private practice. They are speaking out almost every day, openly and for the record, if only we will bother to listen. For example, what do we make of this statement by a prominent physician currently employed by the U.S. Public Health Service: "Among the most significant principles developed at the 1959 joint meeting of the American Hospital Association with the Health Service was the need for the general hospital of the future to be the focal point of all community health services.", and further, that "the question uppermost in the minds of all thoughtful areawide hospital planners should be to determine the type or types of leverage needed to accomplish this objective."? Are we aware that there are already one or more of these "thoughtful areawide hospital planners" working diligently toward this end in Connecticut, and that so-called "leverage"—which, of course, means coercion—is already being applied in varying degrees to some of our colleagues trying to practice privately right here in the Nutmeg State? As an organized group, are we agreeable to being subjected to pressures of this nature—just a few at a time to begin with, of course, or, if we are not agreeable, what do we propose to do to resist them effectively? And when and how and to what extent?

At all levels, medical associations are attempting to communicate with their members; to keep them posted on the trend of the times. But, our efforts not withstanding, is there any reason to believe that more than a handful of private practitioners know of—or have even heard of—the "master" plan for a new system of medicine now under consideration by the American Public Health Association, the initial draft of which is reported to have "won firm support" at a recent meeting of that august body in Miami Beach? I think not! Yet there *is* such a policy nearing adoption by the APHA, and its very foundation is the concept that the integrated center of all health care in the United States is going to be the hospital—just as soon as the public health agencies and some of their key officials can manage to lay hands on enough authority to steer medicine toward a monolithic system of institutional corporate practice. This is something which simply *has* to come about, it is claimed by those who steer the Association, because they—and they alone—are capable of "assuring comprehensiveness, continuity and high quality of personal health services" to the people of the nation. And, pursuant to this policy, I wonder how many physicians would be made to feel more comfortably apathetic about it all in the knowledge that experts like Professor I. S. Falk of the Yale School of Medicine—*not* an M.D., by the way—have refrained from muscling in on the traditional patient-physician relationship up to now *only* "because of a desire to avoid conflict with intransigent medical leadership defending the 'solo' private practitioner?" Many doctors are deeply concerned about this course of events, and I hope it will receive the serious attention it surely warrants—from this House and from the membership-at-large.

In order for the General Manager to be sure that no official correspondence is overlooked and unanswered, it is necessary to examine almost every piece of mail delivered to St. Ronan Street. Not being in practice any longer, it is not a difficult matter to dispose of the assorted drug samples and innumerable reprints which come my way. But, no matter how full the wastebasket becomes, there inevitably remain stacks upon stacks of publications received which are worthy of perusal, and perhaps the most interesting—though most time-consuming—regular duty which confronts your executive officer is that of absorbing the views and opinions expressed by many people on many socio-economic subjects, and of trying them on for size with the realities of Connecticut medical life.

To correlate and categorize and contrast these diversified opinions is often like attempting to put together a difficult jig-saw puzzle—the very piece one thinks is going to fit with the others to make a complete picture just doesn't. As a case in point, a week or so ago I was looking through a press release which came in from National Blue Shield and ran across the following: "Blue Shield alone—of all prepayment plans in operation today—deserves our unstinting support and cooperation (because) it's the one program created by physicians and . . (is) . . directly responsive to the guidance of the profession." Now, a few years ago I think most of us would likely have murmured "Amen!" to that statement, without the need of giving it a second thought. But preachments like this, however exalted they may sound, can neither be made nor received in a vacuum. We must constantly evaluate their meaning in terms of today; we must constantly seek to determine how well they stand up in the crucible of current experience.

For instance, in 1962 where is this "guidance of the profession" the release talks about supposed to fit into the latest medico-economic philosophy of several influential state insurance commissioners, the president of national Blue Cross, and a host of other so-called "experts" that every Blue Shield operation in the country ought to be under the control of a large majority of *laymen* if, indeed, doctors should be allowed to serve as plan directors at all? Now you can bet your bottom dollar that organized labor and others will be back at the General Assembly next session with another bill to put the physician directors of CMS in their alleged proper place—one of minority. But if the bill should be passed—if doctors are, in essence, to be deprived of a legitimate voice in Connecticut Blue Shield, how is the profession supposed to meet the challenge hurled at it by yet another so-called "expert", non-practicing Dr. Ray Trussell of Columbia University, who demands that "organized medicine either take steps to improve the quality of medical care under private insurance" or can expect the public "to demand a government-sponsored health . . . program?" I hope you will share with me the conclusion that the two recommendations of these Cloud 9 health planners are in direct conflict with each other; that if one prevails, its opposite becomes patently impossible. Either physicians will have at least an equal say in Blue Shield planning, or they will not. And if they do not, I find it totally illogical to conceive that laymen, by themselves, are competent to do much of anything about the quality of medical care—not for the better, anyway. It just isn't *their* cup of tea!

Now, for decades, physicians throughout the country have given their "unstinting support and cooperation" not only to Blue Shield but to literally dozens of other reduced-fee and even no-fee programs. In happier times—and not too long ago—our voluntary subsidization of these non-profit plans used to be given a certain degree of public recognition as (and I am quoting from a 1960 sales brochure) "an outstanding contribution of the Connecticut medical profession to the health and welfare of the people." But to paraphrase the Scriptures, what shall this support and cooperation have profited us if the privilege of making a willing contribution to the public welfare becomes converted into a compulsory thing? To what avail have we labored to make the "Service Benefits" principle work and flourish if, as we must now recognize as an accomplished fact, the state insurance commissioner has arbitrarily taken unto himself the authority to decide which people in Connecticut shall receive doctors' services at reduced rates, and which shall not? Wherein can it still be said that hospitals and nursing homes and pharmacists and dentists as well as physicians have acted wisely in agreeing to accept substandard compensation for goods and services provided to welfare beneficiaries if, as the record shows, the public is regularly being led to believe that "the state pays for its own"; that, through a series of administrative miracles, the Welfare Department—all by itself—has (and I quote the Commissioner) "accomplished a reduction in hospital costs; a reduction in convalescent home rates; a reduction in the cost of drugs; . . and dentistry; (and) a general reduction in *all* medical care . . . costs"? It challenges the imagination, doesn't it? Just a wave of the bureaucratic hand, and everything's coming up roses! Yet the welfare budget for 1963-64 will ask for additional millions of dollars!

Members of the House, I have a confession to make. Just now, I led you to believe that I was quoting Mr. Shapiro verbatim, but I wasn't—not quite! He actually didn't tell the Bridgeport Community Council on May 11th of this year that he had been able to bring about a *reduction* in these costs. What he did say—if you want to know the truth—was that his Department now has *control* over medical costs and thus is in a position to set the rates of compensation for hospitals and pharmacists and doctors in accordance with his budget—not theirs. They make the sacrifices privately, but the Department takes the credit publicly. Why don't you give this system a try next time you get a bill from your grocer? Just tell the man you're knocking 20 per cent or so off his charges—you've decided to bring the price of food down!

There is considerable important business to come before this House today, and it would be most inappropriate and selfish for any individual to take up more than his share of your time in making but one report—if, indeed, this somewhat rambling commentary is a report. But in my judgment, the writing is unmistakably on the wall for American medicine in 1962 and thereafter, and private practice will either survive or perish depending on how wisely and effectively its leadership deals with the grave problems presented by the activities of those I have mentioned—the politician, the political appointee to government office, the professional health planner—and others.

Like it or not, these challenges cannot be met by medical leadership on a casual basis, nor can physicians, on their own, expect to preserve their independence if they limit their consideration of the issues involved to approving Contract X because it pays five dollars more or disapproving Contract Y because it pays a dollar or two less. The burning question here is not money—it is freedom. "The basic philosophy written by our founding fathers in the Constitution of the United States seeks to protect the individual from the oppression of despots . . .", writes Dr. Donald W. Sweeney, editor of the *Detroit Medical News,* " (And) our liberties and . . . freedoms are the rewards for the determination of those who are able and disposed to . . . fight for them."

If you agree with me—and I hope you do—that Dr. Sweeney has stated the proposition well, then perhaps you will also agree with his conclusions that "physicians at this time must provide active directorship . . ." and that "we must support . . . leaders in our profession who will fight for our . . . rights . . .".

A few paragraphs back, I reported that Yale's Mr. Falk considers the current leadership of medicine to be "intransigent" in its defense of the private practitioner. Now right here in this auditorium this afternoon sits a very large segment of the leadership of medicine in Connecticut, and I want to be sure that all of you know just what it is you are supposed to be. Intransigent, according to Webster's, connotes the qualities of being radical, irreconcilable and uncompromising.

That being the case, I urge you all to continue your intransigent efforts to preserve the private practice of medicine and to protect the patient-physician relationship as an important two party situation of mutual trust and responsibility; to be as radical as may prove necessary to defend for every Connecticut resident the right to choose his doctor freely from among you; to be as irreconcilable as ever you can toward proposals which would turn over the intensely personal art and science of your profession to the corporate mercies of some kind of gigantic "medical discount houses" which, offering the public "everything under one roof" and probably green stamps to boot, would substitute administrative efficiency for personal attention; and to be uncompromising to the bitter end in your dealings with those who ask you to relinquish your Constitutional liberties in return for political promises of favor or profit—in return for pledges of "peace in our time," to be negotiated at some Munich, U.S.A., yet to be selected by your oppressors.

Only yesterday, I read with great personal disappointment that the AMA Delegates had elected not to take preventive steps to further define the profession's position toward a possible system of Social Security medicine but, instead, to remind themselves (so it is reported) that special or extraordinary sessions of the House might have to be called "should the physicians of the United States and its territories be confronted with a serious threat which would conscript them into involuntary servitude."

I have the highest regard for the leadership of our parent Association, and for the devotion to duty of the members of its House. But, in all conscience, I cannot agree that serious threats of conscripting American physicians into involuntary servitude are limited to a single possible confrontation; that some of the things I have reported on today are not equal or even greater threats; or that the optimum time to lock the barn door is after the horse has been stolen.

I have recently been reading an authentic account of what transpired in Saskatchewan Province last Spring and Summer, and I find that for ten years in advance doctors up there had been carefully planning what they would do in the event that threats became realities. Now, for all their advance preparations, their victory over the dictates of a socialist government left much to be desired but it is significant, I think, that constituting only a bare one-tenth of 1 per cent of the population, they were able to stand their ground; that by temporarily changing the form but not the continuity of patient care, and with the support of a large segment of an informed public, they emerged from the fray not as losers—even if not entirely as winners. Remember, if you will, that their cause was the same as ours—to preserve professional freedom, and of that they salvaged at least a measure. I wonder if we can afford to do less in building our defensive positions than they did? I wonder if we can afford the luxury of following a "wait and see" policy? I don't believe we can.

Respectfully submitted,
William R. Richards, M.D.

12/4/62

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The Society's Placement Service is in receipt of the following:

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Surgeon – Board qualified through university training, interested in good association.

House Physician: Foreign graduate, permanent resident, ECFMG Standard Certificate, with University hospital training in U. S. seeks position as House Physician preferably in surgical and emergency service.

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Wanted: Physician in Litchfield County.

Wanted: Ophthalmologist in the New Haven area.

Opportunity available for a physician in the New Haven area to cover a General Practitioner on weekends, various evenings, and for periodic vacation intervals. Will pay $100 monthly in addition to the individual fees collected for services rendered.

Board eligible internist or qualified General Practitioners interested in internal medicine for a salaried post in a fraternal convalescent hospital in New Haven County. Salary about $15,000.

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NEW BOOKS IN REVIEW

THE CARDIAC ARRHYTHMIAS by Brendan Phibbs, M.D. The C. V. Mosby Co., St. Louis, Missouri, 1961, 128 pp., $7.50.

Reviewed by: LOUIS H. NAHUM

The book is written to teach physicians who are not cardiologists to diagnose and treat cardiac arrhythmias. It is the author's thesis that since clinical diagnosis of arrhythmias is difficult and electrocardiographic diagnosis simple, that therefore every physician must learn to use the electrocardiogram to make an adequate diagnosis. Accordingly, the book is organized along the following lines: (a) A review of basic anatomy and physiology illustrating the sequence of events in normal and abnormal heart mechanisms. Following this the electrocardiographic representation is described in detail. Then the arrhythmias are described and illustrated by numerous electrocardiograms. The clinical features that are helpful are described and therapy for each arrhythmia with dosages and exact procedures are outlined. At the end of the book some exercises for practice are included.

The book is too simple to be of any great use to cardiologists and is really intended for the general practitioners, anesthesiologists, surgeons and medical students who are already in the clinic and internes. It is unsophisticated and straightforward and quite limited since it deals primarily with the interpretation of the arrhythmias. If in addition to an arrhythmia other problems of electrocardiographic interpretation must be gleaned from the record, the reader will have to resort to another book.

In an attempt at simplification, much had to be left out. Thus we find that the left bundle branch is shown to be one structure instead of a superior and inferior branch. The ST segment is a "quiet" period when in fact active repolarization is already in progress. The refractory period is a "fatigue" rather than electrically inexcitable period. Ventricular ectopic beats are shown from right and left ventricles and apex in Figure 14, although the exact origin of such a beat can only be determined from their configuration in leads 1, 2 and 3.

The therapy section is especially inadequate. Thus, for example, mecholyl in 20 mg. doses subcutaneously is mentioned in treating atrial tachycardia, a method inadequate and long ago abandoned. Conversion of atrial fibrillation of recent origin is suggested although a large and damaged heart should be treated with digitalis without attempts at conversion. Finally, in the treatment of a pulseless patient the physician is urged to open the chest at once. Such a radical procedure is now obviated by closed heart cardiac massage.

The final chapter is well organized containing exercises for diagnosis. With so many electrocardiograms available it should not be necessary to show one with inaccurate standardization as is no. 2 page 117. When all these minor points are said, Dr. Blount who writes the foreword is correct when he says that this book is an attempt at simplification, with the hope that any medical school graduate may attain some degree of competence in the interpretation of the common cardiac arrhythmias.

WOUND VALLISTICS IN WORLD WAR II. Edited by Major James C. Beyer, M.C. Volume XIX—History Medical Department U. S. Army. Editor in Chief, Colonel John B. Coates, Jr., M.C. Published: Department of The Army, Washington, D.C. 883 pp.

Reviewed by: DENIS S. O'CONNOR

In the midst of a major war it would hardly be expected that much consideration would be given to research on the specific effects of certain weapons and it would likewise not be expected that personnel enthusiasm for the work would exist. And yet, review of this volume reveals material that not only will be valuable in developing personnel protection for future wars as it already has done in the Korean War but its value in other respects is widespread.

The first three chapters covering the patterns of damage from so many different weapons requires the availability of this volume to all police officials concerned with crime involving weapons, to medical examiners and coroners, pathologists concerned with investigation of violent deaths, the prosecutors and the defendants' attorneys of missile crimes.

While the information in this volume has value for the medical military officer, especially in helping him to evaluate the efficiency of his own units in the care of casualties, it can be of even greater value to the line officers who have the responsibility of training our fighting men and who also have the responsibility of providing maximum personnel protection against injury. It has even further value to the line in the knowledge afforded concerning the effectiveness of weapons in relation to terrain and other factors.

This reviewer was particularly interested in the chapter concerning the Bougainville Campaign which was primarily the work of the late Colonel Ashley W. Oughterson, M.D. The painstaking detailed analysis of the casualties in this area, covering 175 pages, is a tribute to the attention to detail and analysis so characteristic of Colonel Oughterson.

Already, even before this volume was published, the studies on missile wounds were put to good use in experimental personnel protective measures during the Korean War. While this is a good beginning, the interest at this time could be the proximity of the Korean affair in time to World War II.

The great danger to the utilization of this highly important study is that the urgency of personnel protection will be dimmed by time. Major Beyer has stated the problem well in his preface. "It is perhaps a natural consequence of the American philosophy not to maintain a constant interest in certain military matters in peace time. However, it is costly, both from the usual sense of time and money lost and from the even more fundamental and irreplaceable point of view of human lives of being lost when certain fundamental suggestions and conclusions reached in one war are completely lost in intervening times, and the points have to be regained in subsequent wars."

I can only urge with the utmost emphasis that all the types of individuals previously referred to, civilian as well as military, take advantage of the opportunity to add an outstandingly valuable factual study of missile injuries to their libraries.

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MYELOGRAPHY by Robert Shapiro, M.D. Year Book Medical Publishers, Inc., Chicago, Illinois, 1962, 288 pp. 236 figures, $11.00.

Reviewed by: SAUL A. FRANKEL

Although myelography has been in existence for over forty years and has been extensively practiced for more than twenty-five, this book is the first comprehensive work devoted to this subject. As such it fulfills without question a real need. The author draws upon his wide personal experience with the procedure, and provides as well a review of a massive body of literature, documented by a bibliography following each chapter.

The history of myelography is sketched briefly. Descriptions are given not only of the Pantopaque technique commonly used in this country, but of the use of air and Abrodil, as well as other contrast media of historical interest only. A chapter on discography is included. The indications for myelography and the shortcomings of the procedure are presented. There is an excellent anatomical review of the spinal meninges and their neural and vascular contents. There are detailed descriptions of the normal and the pathological myelogram, and of the artifacts which may be encountered. This material occupies nine of the thirteen chapters, and in the aggregate comprises the primarily radiological portion of the book. There is an abundance of good meat here, well organized to be palatable and easily digestible.

There are three chapters devoted to a clinical review of the various pathologic entities which affect the spinal canal, with a presentation of the myelographic findings in each. One of these chapters is a dissertation on the intervertebral disc, for which more myelograms are probably performed than all other reasons combined. Within these chapters the author enters the realms of clinical neurology and neurosurgery. Here, unfortunately, occasional errors occur which reveal an imperfect understanding of certain concepts in embryology, neuroanatomy and neurophysiology. The chapter on spinal cord diseases covers a very broad clinical area within a relatively small allotment of space. The result is a superficial catalogue which is not up to the standard of the rest of the book.

In assessing the value of a diagnostic procedure the clinician must be familiar with its limitations, the possible sources of error, and the risks. While Dr. Shapiro describes these factors in a qualitative way, he chooses to refrain from quoting statistics. Accurate statistics are admittedly hard to come by, and subject to errors in interpretation. Nevertheless, it would be of great value to have an objective evaluation of the percentage of accuracy of myelography. Armed with such information, the surgeon knows how much reliance to place upon the myelographic findings in arriving at his diagnosis.

In a volume of this sort illustrations are of paramount importance. Excellent reproductions of radiographs are provided in abundance. There are also numerous line drawings, most of them diagramatic. It is disturbing to find many of these plagued by errors in representing the anatomy of the meninges. This occurs most frequently in the cross section diagrams of the spinal canal. A consistent scheme is not followed, and labels are rarely used. The technical quality of the art work could be improved considerably.

On balance, the virtues of this work outweigh by far its deficiencies, most of which could be eliminated by further editing and polishing. This should prove to be a very useful book to all who would further their knowledge of neuroradiology.

SURGERY OF THE AMBULATORY CHILD by S. Frank Redo, M.D. Appleton-Century-Crofts, Inc., New York, 1961, 340 pp.

Reviewed by: JAMES R. CULLEN

The foreword by Dr. Frank Glenn emphasizes the purpose of the book, which is to provide criteria for the selection of those cases which can be treated on an ambulatory basis and those for which hospitalization appears advisable. The book emphasizes throughout the problems seen in the pediatric patient which may require an aproach different than in the adult.

The first of seven parts carefully describes materials and methods of pre and postoperative care, including the use of antibiotics and chemotherapeutics. The sections on soft tissue trauma, fractures and inflammation deal with these conditions in various areas of the body. Each sub-section here is complete, thereby providing ready access to detail without need to refer to previous discussion. The repetitive detail makes for uninteresting reading throughout these sections.

Soft tissue tumors; burns, bites and stings; and operatively created stomata are discussed in the remaining sections in detail sufficient to provide the fundamental concepts of their care in the ambulatory patient.

The techniques from the author's own armamentarium are generally accepted and have survived the test of time. Thus, while only one of several approaches to a given situation is presented, the collection provides a fairly complete handbook for the pediatrician or general practitioner, who though untrained in surgery, may nevertheless be called on in the course of his practice to treat any one of several minor surgical entities in the pediatric patient. Considerable attention in each section is given to the limits of what can be accomplished best on an ambulatory basis and at what point hospital or specialist care is indicated.

MODERN CONCEPTS OF HOSPITAL ADMINISTRATION. Joseph K. Owen, Ph.D. W. B. Saunders Company, Philadelphia, Pennsylvania, 1962, 805 pp.

Reviewed by: JOHN E. IVES

This textbook of hospital administration is dedicated to Dr. Malcolm T. MacEachern whose standard text on hospital administration this book is apparently to emulate and update. It is an amalgum of contributions by 73 authors and covers as many subjects. In terms of the areas covered, it is a most complete reference and text material.

In contrast to MacEachern, which views the administration of the hospital using as the base departmental operations, this book covers the philosophy of the various components of the hospital and attempts to establish a basis by which the administrator can plan the operation of his hospital not only for the present day but for the future The subjects covered by the various contributors range from an excellent chapter by Michael M. Davis, Ph.D. on the hospital's position in American Society to chapters covering specific areas such as the laundry or business services. As one might expect in a compendium of this nature, there are some very strong chapters and others which do not quite meet the needs of a text of this scope. This inconsistency of quality and content between the various sections of the book is perhaps the greatest weakness as a text. On one hand, the chapter on emergency service seems to be written by an individual with little experience in the scope of service, design and location of such a unit. The chapter itself is very sketchedly written and not of much help to any administrator with even a passing acquaintance with such a service. On the other hand, other chapters offer much detailed information to the administrator or student. The medical records chapter written by an acknowledged expert in the field goes into considerable minute detail regarding the operations of a medical records department and serves as both a fine initial introduction to a medical records department and a good refresher course for the experienced administrator.

While this book leaves something to be desired as a teaching text because of its inconsistencies, it is a valuable book for the administrator's reference library because of its many excellent contributions.

THE NERVOUS SYSTEM. An Outline of the Structure and Function of the Human Nervous System and Sense Organs by G. M. Wyburn, Professor of Anatomy, University of Glasgow. Academic Press, London and New York, 1960, 184 pp.

Reviewed by: LOUIS H. NAHUM

The book consists of fifteen chapters and an index. In the introduction the basic concepts of the neuron, synapse, nerve fiber, cellular sheath, fiber degeneration, the nerve impulse, synaptic transmission, are clearly defined in simple didactic language. There follow chapters on the anatomy of the CNS cutaneous senses, proprioceptors motoneurons, the eye, hearing, the chemical senses, the speech mechanism, the autonomic nervous system, the hypothalamus, the electroencephalogram, the reticular formation, the cerebral hemisphere and consciousness, chemical regulation of the central nervous system and finally, blood vessels and cerebrospinal fluid. The limbic system is not covered.

Traditionally neuroanatomy is given as a set of lectures and likewise, neurophysiology is usually not given at the same time. A book that would successfully eliminate this dichotomy would be extremely helpful to the medical student who is just beginning the study of this difficult subject. But there are many others to whom the information in this book would be extremely useful such as speech therapists, physiotherapists, psychotherapist, occupational therapists who need some understanding of the mechanism of the nervous system and have no other alternative than to abstract whatever knowledge they require from relevant sections of medical textbooks both of anatomy and physiology.

There is so much about the central nervous system that is unknown that any outline should make clear to the reader where knowledge is incomplete, what the difficulties are, and what present speculations have to say as to the meaning of the different types and arrangements of nerve cells, fibers, central chemical transmitters, sensory specificity and the "higher" functions of the brain. This book does just that.

The drawings are excellent and have been obtained from direct observations of specimens and sections without which there could be no satisfactory understanding of the anatomy of the brain and special senses.

Around The State

New Haven County

William Mendelsohn, M.D., has been honored with a 20-year service award by the Connecticut Division, American Cancer Society.

The ceremony, citing the New Haven surgeon for leadership efforts in cancer control, was held recently at the group's annual meeting, in the New Haven Lawn Club.

Dr. Mendelsohn, chief of the Cancer Coordinating Committee of the Connecticut State Medical Society, is on the State Medical Advisory Committee of the cancer society, and is one of the original trustees and incorporators of the state cancer group. He is a past president of the New Haven Cancer Branch, serving in 1947-1948.

A member of the surgical staffs of Grace-New Haven Community Hospital and the Hospital of St. Raphael, he is a graduate of Yale University, class of 1924.

Dr. Mendelsohn received his M.S. degree from the Yale Graduate School in 1929; his M.D., from Johns Hopkins in 1933. He served on the staffs of Mt. Sinai Hospital, Cleveland, the Carnegie Institution of Washington, Columbia University and Leland Stanford University, prior to making his home in New Haven.

1963 MEETINGS

March 28—179th Annual Meeting, New Haven County Medical Association. Business Meeting is tentatively scheduled for 2:30 P.M. Place of meeting not decided yet.

April 30-May 1-2—171st Annual Meeting, Connecticut State Medical Society, Statler-Hilton Hotel, Hartford.

May 15—Third Symposium on Graduate and Postgraduate Medical Education in the Community Hospitals to be held at the Yale-New Haven Medical Center, 1:30-5:30 P.M. Sponsored by the Connecticut State Medical Society, Connecticut Hospital Association and Yale School of Medicine.

June 16-20 – American Medical Association, Annual Meeting to be held in Atlantic City.

September 27—38th Connecticut Clinical Congress to be held at the Yale-New Haven Medical Center.

In Memoriam

Hepburn, Thomas N.—Hartford; Johns Hopkins University, 1904; Dr. Hepburn was a leading Hartford physician for more than 50 years. Dr. Hepburn was a resident surgeon at Hartford Hospital from 1907 until 1911 when he set up a private practice as Hartford's first urologist. Some of the posts he held at Hartford Hospital were; first assistant visiting surgeon; assistant-at-large; assistant surgeon, cystocopist; and visiting urologist. At various times Dr. Hepburn served as consulting urologist at the following hospitals: Bristol; Rockville General; Charlotte Hungerford; Meriden General; and Manchester General. Dr. Hepburn served as surgical chief of the Military Consulting Board during World War I and was a charter member of the Board of Urology. He was a founder and board member of the American Social Hygiene Association which campaigned to eliminate venereal disease before World War I and was a president of the Connecticut Social Hygiene Society. Dr. Hepburn was also a Fellow of the American College of Surgeons, former member and chairman of the board of the Hartford County Medical Society, Hartford Medical Society, New England Surgical Society and the American Board of Urology. He was also a member of the Connecticut State Medical Society and the American Medical Association. Dr. Hepburn died November 20 at the age of 82.

Russell, Walter I.—New Haven; Yale Medical School, 1909; Dr. Russell served as full attending physician in medicine at Grace Hospital for 20 years, and had served as consultant in medicine at Grace-New Haven Hospital since 1953. He entered general practice in 1911. Dr. Russell is a former president of the Connecticut State Medical Society (1958-1959) and also served as president of the New Haven Medical Association in 1942 and the New Haven County Medical Association in 1951. Dr. Russell was a charter member of the Connecticut State Medical Society's councilor society in 1954 and 1955. He was a member of the Professional Policy Planning Committee of the Connecticut Medical Service until 1958, and also served on the CMS Board of Directors. Dr. Russell held membership in the American Medical Association. He also was a member of the Medical Advisory Board of the Woodruff Rehabilitation Center and the courtesy staff of St. Raphael's Hospital. Dr. Russell was a member of the Wooster Lodge, AF and AM, for 50 years. Dr. Russell died November 24 at the age of 76.

Soltz, Thomas—New London; Jefferson Medical School, 1911; Dr. Soltz was associated with Home Memorial Hospital and was a visiting surgeon in the New London area. Dr. Soltz died on October 19 at the age of 73.

OBITUARY

Ralph Hathaway Jenkins, M.D.

1892 - 1962

Ralph Hathaway Jenkins was born in Baltimore, Maryland, in 1892. He received his medical degree from the College of Virginia in 1916 and immediately entered the United States Navy. He spent six years in the Naval Service rising to the rank of Lieutenant Commander. Because of ear injury resulting in difficult hearing he was released from the Navy and spent two years in postgraduate work in urology at the Brady Urological Institute at Johns Hopkins Hospital.

In 1927 Dr. Jenkins moved to New Haven, Connecticut, and took supervision over the local clinic for the New York, New Haven and Hartford Railroad which position he held until he retired in 1960. He became an expert witness for the railroad causing the diagnosis of railroad spines not only to diminish but almost disappear resulting in great financial saving for the railroad.

His interest in urology was not to be forsaken and he was given an appointment to the Urological Department of Yale School of Medicine where he took an active part in teaching and research. He rose to the position of associate clinical professor in urology and published numerous articles. Dr. Jenkins was a member of the A.M.A.; A.U.A.; Sigma Xi; the New Haven County Medical Association, and the Connecticut State Medical Society.

Ralph Jenkins developed a good urological practice. He was best recognized for his happy-go-lucky nature and made friends readily. His congenial personality and hearty laugh were contagious. He died of carcinoma of the lung on June 5, 1962, and leaves a wife, daughter and two grandchildren. Urology has lost a congenial companion and medicine a devoted colleague.

Clyde L. Deming, m.d.

Special Notices

YALE MEDICAL SOCIETY LECTURE

January 8, 1963

The Yale Medical Society will present a lecture on "The Pathogenesis of Hyperchloremic Renal Tubular Acidosis" by Donald W. Seldin, M.D., professor of medicine, Southwestern Medical School, University of Texas.

This meeting will be held at 5:00 P.M. Tuesday, January 8, 1963 in the Mary S. Harkness Memorial Auditorium at the Yale School of Medicine, 333 Cedar Street, New Haven. Interested physicians are invited to attend.

YALE UNIVERSITY SCHOOL OF MEDICINE

will present a

Special Postgraduate Course for Practicing Physicians

Rheumatic Diseases—Care Of The Patient

February 6-March 27, 1963

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7:00-9:00 P.M. Wednesday evenings, February 6-March 27, 1963.

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Subjects to be discussed will include: Functional Visual and the Correlative Disturbances; The Tasks of Pleoptics and Orthoptics and Their Practical Solution; Amblyopia-Prophylaxis and Treatment after the "St. Gall Method"; The General Problem of Squint Surgery; and Disturbances of Lacrimal Drainage. Inquiries regarding registration may be addressed to Mrs. Tamar Weber, Registrar, Institute of Ophthalmology of the Americas, New York Eye and Ear Infirmary, 218 Second Avenue, New York 3, N. Y.

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Subject: "Medical Problems in India"

January 11-12 (2-Day Visiting Internist)—George Ludwig, M.D., Associate Professor of Medicine, University of Pennsylvania School of Medicine.
January 11—3:00 P.M., Medical Rounds, Newington V.A. Hospital.
January 12—11:00 A.M., H. H. Amphitheater
Subject: "Diseases of Porphyrin Metabolism"

January 19—Francis Braceland, M.D., Director, Institute of Living, Hartford.
Subject: "Mental Health and the Community"

January 26—Benjamin Spector, M.D., Professor of Anatomy, Tufts; Subject: "Neuroanatomy and Clinical Neurologic Syndromes"

February 2—Robert E. Nesbitt, Jr., M.D., Professor of Obstetrics-Gynecology, Albany Medical School
Subjects: 10:00 A.M.—"Stress Incontinence"
11:00 A.M.—"Polycystic Ovary Syndrome"

February 8-9 (2-Day Visiting Pediatrician)—Charles Janeway, M.D., Professor of Pediatrics, Harvard Medical School.
February 8—Grand Rounds, Pediatric Service
February 9—11:00 A.M., H. H. Amphitheater
Subject: "Fluid and Electrolyte Balance in Infancy"

February 16—D. Carleton Gajdusek, M.D., National Institutes of Health; Subject: "Genetics and Pediatrics"

February 23—Miller Fisher, M.D., Assistant Professor of Neurology, Harvard Medical School.
Subject: "Cerebrovascular Disease"

February 28-March 2 (3-Day Visiting Surgeon)—David Hume, M.D., Professor of Surgery, Medical College of Virginia.
February 28—Newington V.A. Hospital
March 1—House Staff Rounds and Conferences
March 2—H. H. Amphitheater
9:00 A.M.—"Surgical Conference"
11:00 A.M.——"Changing Concepts in Surgery"
March 2—10:00 A.M. Grand Rounds

March 9—Robert Coon, M.D., Professor of Pathology, University of Vermont
Subject: "The Laboratory and Clinical Medicine"

March 16—Joseph Beninson, M.D., Henry Ford Hospital, Detroit
Subjects: 10:00 A.M.—"Varicose Veins in Obstetrics-Gynecology."
11:00 A.M.—"Pressure Gradient Therapy in Varicose Veins"

March 23—Averill Liebow, M.D., Professor of Pathology, Yale
Subject: "Newer Aspects of Pulmonary Circulation"

March 30—Howard Ulfelder, M.D., Clinical Professor of Gynecology, Harvard
Subjects: 10:00 A.M.—"Carcinoma of the Cervix"
11:00 A.M.—"Endometriosis"

Connecticut Medicine

Connecticut State Medical Journal

VOLUME 27, FEBRUARY, 1963, NUMBER 2

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Bernard Lytton, James B. D. Mark and B. Marvin Harvard — **Continuous Intra-arterial Chemotherapy In Advanced Bladder Cancer**

Robert A. Chase — **The Management Of Congenital Cleft Lip And Palate Deformity**

William H. Sewell — **A Basic Physiological Approach To Myocardial Revascularization**

F. A. Simeone — **Shock And Its Treatment**

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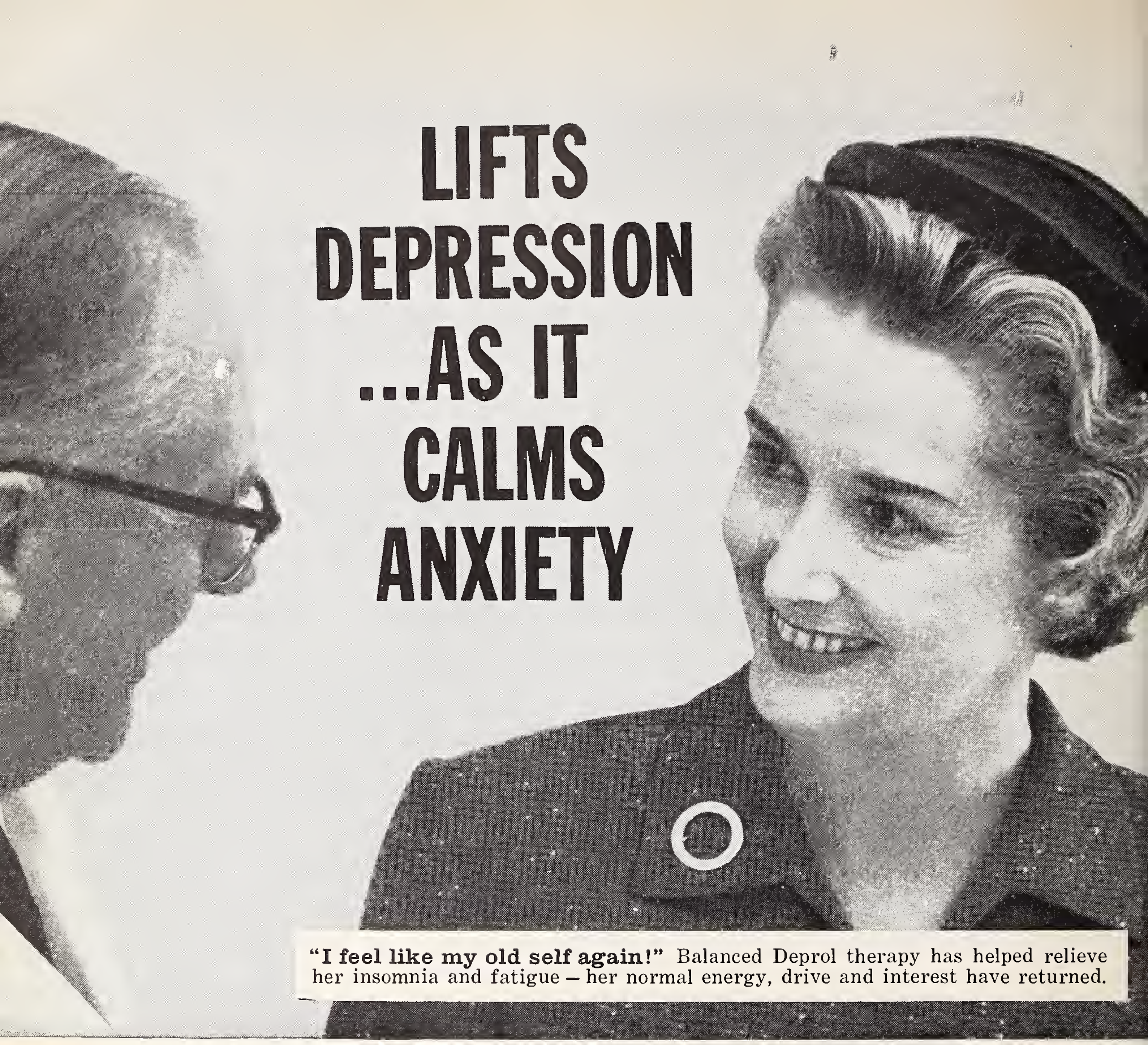

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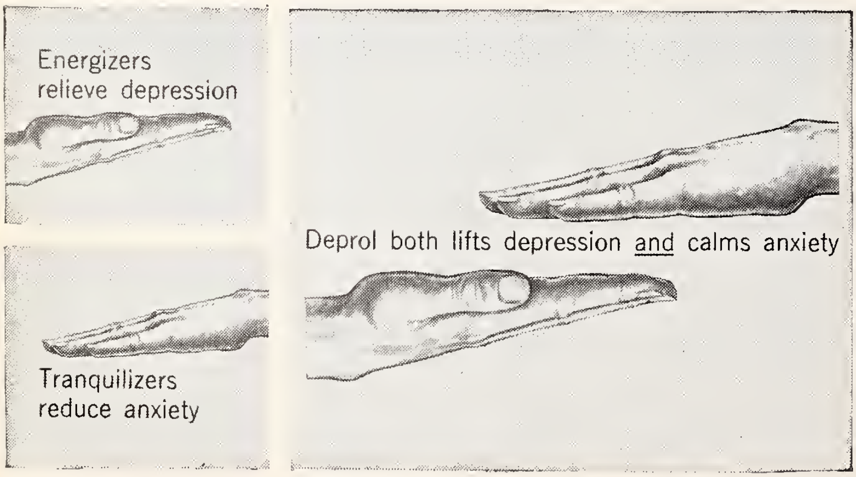
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Continuous Intra-arterial Chemotherapy In Advanced Bladder Cancer

A Preliminary Report

Bernard Lytton, M.D.
James B. D. Mark, M.D.
B. Marvin Harvard, M.D.
New Haven

Introduction

The management of patients with inoperable bladder cancer still presents a serious problem. These patients often have intractable pain, lymphatic and/or venous obstruction of the lower extremity and urinary symptoms of varying severity.

Anti-cancer drugs have been used with different degrees of success for some time. Alkylating agents, such as nitrogen mustard which selectively destroy actively dividing cells were used first, more recently anti-metabolites which interfere with varying stages of nucleic acid synthesis have been used. These agents were first administered systemically by intravenous injection, resulting in considerable dilution of the drug by the time it reached the tumor and significant toxicity when effective cancericidal doses were given. In 1950 Klopp and his associates administered nitrogen mustard into the brachial artery. This produced a pronounced local cutaneous reaction which was reversible. They then conceived the idea of treating tumors by direct injection of their arterial blood supply, thereby hoping to improve the tumor effect and lessen the toxicity of the drug. At about the same time Bierman, *et al,* reported on 20 cases of patients with malignant disease treated by direct intra-arterial injection of nitrogen mustard and found that they were able to use larger doses and produce less toxic effects on bone marrow with this route of administration as compared with the intravenous route. The results of these two studies were encouraging and led to the development of a new field of investigation into methods of treatment of malignant disease by intra-arterial injection of chemotherapeutic agents which culminated in the development of regional arterial perfusion by Creech and his associates in 1958. Recently, a number of workers (Sullivan, *et al,* Stehlin, *et al,* Mark and Calabresi) have been using the technique of continuous intra-arterial infusion by indwelling catheters. There have been a few reports of the treatment of pelvic tumors by these methods.

Regional *perfusion* of the pelvic organs is attended by the difficulty of good vascular isolation. The amount of leakage of the drug into the systemic circulation has been shown to be as high as 60 per cent in a 45 minute pelvic perfusion (Jessiman 1960). The resultant toxic effects limits perfusion time and therefore the length of exposure of tumor to the drug. It furthermore has the disadvantage of being a major surgical procedure. This is particularly pertinent in the treatment of advanced pelvic malignant disease, as many of these patients are in a poor physical condition and extensive pelvic spread of the tumor may prevent accomplishment of the perfusion.

From the Section of Urology and the Department of Surgery, Yale University School of Medicine, New Haven, Connecticut.

This work was supported in part by an Institutional Grant awarded by the American Cancer Society to Yale University. The patients reported were studied in the Yale Clinical Research Center, supported by United States Public Health Grant OG-14.

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Continuous intra-arterial *infusion* of the chemotherapeutic agents via indwelling catheters is not open to these objections. No attempt is made to prevent leakage as it is thought that much of the drug, as it is being administered slowly, is taken up in the tumor tissue before it enters the venous side of the circulation. The procedure is simple, takes little time, and produces minimal disturbance in the patient. The few reported cases have shown encouraging results, but these have been insufficient to compare with results of X-ray therapy, the most widely used form of palliation at present. It appears from the few available reports that 5-fluoro-uracil (5 F.U.), an anti-metabolite, is probably the most effective drug in the treatment of bladder cancer. The transitional cell type of tumor is said to be particularly susceptible (Warren Bell 1961). This type of treatment, therefore, seemed to offer a reasonable chance of effective palliation in cases of advanced malignant disease of the bladder. We present here a preliminary report of the results in three patients with advanced carcinoma of the bladder treated by slow continuous intra-arterial infusion of 5 F.U. via the internal iliac arteries.

Methods

Each internal iliac artery is approached extraperitoneally through a small oblique incision in the lower abdomen. The incision begins about 1½ inches below and medial to the anterior-superior iliac spine and extends downwards and medially to the lateral border of the rectus muscle. The muscle layers are split as in a gridiron incision and the peritoneum is reflected medially to expose the iliac vessels. The ureter is identified and restracted medially. The common iliac, internal and external iliac arteries are dissected free and tapes are passed around them to provide control of the arterial flow as required. The ilio-lumbar artery, which is the first branch of the internal iliac artery, arises posteriorly and passes postero laterally. The vessel is identified and dissected free as far distally as possible. A number 15 guage polyethylene catheter is inserted proximally into the ilio-lumbar artery through a small arteriotomy and positioned so that its tip just projects into the internal iliac artery. A ligature is tied around the ilio-lumbar artery to secure the catheter in position and this vessel is then divided. A Rummel ligature is then also passed round the vessel. (Figure I) Each catheter is brought out retroperitoneally through a small stab incision in the skin just above the original incision and is connected to a slow continuous infusion apparatus, which consists of a pump capable of supplying a known amount of fluid at a constant rate from a reservoir containing the drug in solution. A dose of 7.5 milligrams of 5-FU per kilogram body weight in 500 ml. of 5 per cent glucose is administered during each 24 hours through each catheter over a period of 5-7 days. A total of 3-6 grams of the drug is thus administered. At the end of the course of treatment the catheters are withdrawn and the Rummel ligatures tightened to prevent bleeding. After four or five days the Rummel ligatures are also removed.

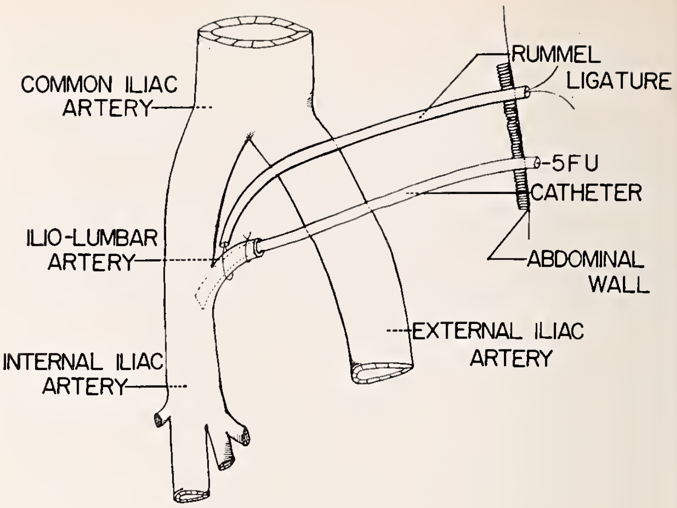

Figure I

Patients who have previously received pelvic irradiation have been shown to exhibit drug toxicity in the form of bone marrow depression with a smaller dose of drug than those who have not received irradiation. These patients, therefore, undergo a pyrexal test (Fink & Calabresi) prior to treatment in order to evaluate bone marrow reserve. It is suggested that drug dosage be reduced or treatment delayed if bone marrow response is shown to be significantly suppressed.

Case No. 1

A 55 year old white male in October 1959 underwent partial cystectomy for a transitional cell papillary carcinoma of the bladder. He remained well for two years, but in November 1961 he complained of pain of increasing severity in the right lower quadrant and groin which, on subsequent surgical exploration, was found to be due to extensive extravesical recurrence of tumor. He was started on a course of x-ray therapy which had to be discontinued after he had received 700 R because of severe nausea, vomiting and general malaise. On April 8, 1962, he was admitted to the Grace-New Haven Hospital where he was found to be pale and chronically ill in appearance. He required large doses of Demerol for relief of pain. Frequency, urgency and incontinence of urine were also present. There was gross painful swelling of the right lower limb from groin to toes and a hard mass in the right lower quadrant arising out of the pelvis extending to just below the iliac crest. Hemoglobin was 8.3 grams, WBC was 8500 and alkaline phosphatase was 30.4 units. An excretory urogram revealed non-function of the right kidney and a normally functioning left kidney, with early hydroureter due to stricture in the vicinity of the ureterovesical junction. The pyrexal test gave a response which was within normal limits.

A urethral catheter was inserted to relieve his urinary symptoms and anemia was corrected with blood transfusions. He was then given a five day course of continuous intra-arterial infusion of 5 FU through a catheter in the left internal iliac artery as previously described. The right internal iliac artery could not be catheterized due to extensive involvement by tumor tissue. Correct catheter placement was confirmed by fluorescein injection (Sullivan).

Seven days after the commencement of the infusion and two days after its completion, swelling in the right leg began to decrease and after three weeks it subsided almost completely, leaving only a small amount of residual swelling around the ankle. The mass in the right lower quadrant decreased in size and was just palpable about the inguinal ligament after three weeks. This objective recession of the tumor was accompanied by dramatic relief of pain. The indwelling catheter was removed two weeks after the onset of treatment, and the patient was able to get out of bed for the first time in many weeks. He was discharged home seven weeks after admission, voiding satisfactorily and able to walk. He had no pain although he complained of considarable weakness and easy fatiguability.

Four months after the initiation of chemotherapy his condition deteriorated fairly rapidly. He developed cutaneous metastases and died two weeks later. He had no recurrence of pain.

Case No. 2

A 65 year old white male developed progressively increasing pain in the left hip three weeks prior to his admission to the hospital. He admitted to two minor episodes of hematuria and frequenecy over the past year. There was found to be an osteolytic lesion in the left acetabulum and a large papillary carcinoma of the bladder was seen at cystoscopy. Excretory urography showed early hydronephrosis on the right side and no excretion of dye on the left side. Biopsy of the tumor demonstrated an adenocarcinoma of the bladder.

The patient was given a course of irradiation therapy to the left hip for a total of 3,290 R over 26 days. He obtained good relief of pain but required catheter drainage because of frequency and dysuria. However, pain recurred three weeks after completion of irradiation therapy, and he required increasing amounts of Demerol for its relief. The pyrexal test produced a satisfactory response.

A continuous intra-arterial infusion of 5 gms of 5-FU was administered through both internal iliac arteries over five days. Eight days later the patient had considerably less pain. Three weeks later his catheter was removed and he was able to void normally. He was also able to get out of bed and experienced pain in the hip only on excessive movement. There was x-ray evidence of re-calcification of the lesion in the acetabulum. Four months after chemotherapy, the patient's pain in the left hip began to return and his condition deteriorated rapidly and he died quietly three weeks later.

Case No. 3

A 66 year old white male was admitted to the West Haven Veterans Hospital on July 25, 1962, with increasing constipation and colicky addominal pain of one weeks duration. He had lost 40 pounds in wieght and had had some frequency of micturition over the past few months. He also gave a one year history of diabetes mellitus adequately controlled with Tolbutamide.

On examination he was a small, pale, thin man in no apparent distress. The abdomen was moderately distended and tympanitic with increased bowel sounds. On rectal examination, he had a hard, irregular, tender, fixed mass filling the pelvis, encircling the rectum and almost completely obstructing it's lumen. A rectal biopsy revealed an anaplastic transitional cell carcinoma invading the submucosa of the rectum. A solid and papillary tumor almost filling the left side of the bladder was seen at cystoscopy and biopsy of this tumor showed a histologic picture similar to that of the rectal biopsy.

Two days after his admission he became oliguric and had complete anuria within 24 hours. A right nephrostomy was performed. The output of urine from the right kidney gradually increased in quantity and after eight days he was excreting 37 litres of urine a day. There was no anti-diuretic response to injections of pitressin and it was thought that the high urinary output was due to severe tubular damage as a result of longstanding urinary obstruction. The patient was maintained in good fluid and electrolyte balance by intravenous therapy. His rectal obstruction, abdominal pain and occasional vomiting persisted and he was treated by nasogastric suction. Eight days after the nephrostomy had been performed, the urinary output began to decrease gradually to between 5 and 7 litres per day over the next two weeks. Two weeks after his original admission to the hospital, he was transferred to the Grace-New Haven Hospital where both internal iliac arteries were catheterized and a continuous infusion of 6.5 grams of 5-FU was given over a period of seven days. He developed a mild stomatitis and fairly severe patchy erythema and blistering of the skin of the scrotum and back ten days after the onset of treatment. The stomatitis healed after a few days but the cutaneous lesions took 2-3 weeks to recover. Two weeks after the onset of treatment his constipation decreased, he began to pass flatus and feces freely, and his appetite improved. Three weeks later he began to pass urine per urethra again in increasing quantities and is at present passing about one-third of his urinary output, which has now reached normal proportions, through the urethra. Five weeks after beginning treatment the patient is beginning to gain weight, is getting up out of bed and is able to walk a little. The mass in his pelvis has decreased to about two-thirds of its original size and the rectal obstruction is considerably diminished.

Discussion

A good palliative effect was obtained in the first patient. His death, which was due to systemic dissemination of disease, was a comfortable one. The second patient, whose symptoms recurred following X-ray therapy, experienced a second gratifying remission of symptoms from chemotherapy. In the first two cases there was no progression of the partial ureteral obstruction which was present prior to treatment following chemotherapy. In the third case there has been regression of the ureteral obstruction and the decrease in rectal obstruction has saved the patient the necessity of a colostomy.

It has been reported by Lemon and Sullivan, *et al,* that slow, prolonged administration of 5-FU results in a decreased incidence of toxic manifestations. Two to three times the dose which is normally given is a single daily injection is well tolerated in this manner without any demonstrable decrease in the anti-cancer effect. The mechanism of this phenomenon is not understood. Prolonged administration of the drug has the advantage of exposing the maximum number of dividing tumor cells to the tumoricidal agent.

The internal iliac arteries are not ligated since it is probable that good oxygenation of the tumor is necessary to obtain a maximal anti-neoplastic effect when anti-metabolites are used. This is supported by the work of Churchill-Davidson, *et al,* who have shown that increased oxygenation of cells renders them more susceptible to the effects of irradiation and alkylating agents.

Summary

The palliative treatment of advanced malignant disease of the bladder using chemotherapeutic drugs administered intra-arterially is discussed.

A method of direct continuous intra-arterial infusion of pelvic tumors with an anti-metabolite, 5-fluoro-uracil, is described. Three patients with advanced bladder carcinoma treated in this manner are reported.

It is concluded that the palliative effects of this form of treatment are encouraging.

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The most recent pronouncement from Chief Rabbi Herzog, of the Hadassah University Hospital of Jerusalem, sanctions post-mortem examinations when "I. They are legally required II. the cause of death cannot be otherwise ascertained, provided this is formally attested in writing by three physicians . . . III. They may help save the lives of other existing patients as similarly attested, and IV. they are required in cases of hereditary diseases to safeguard the health of the surviving relations; provided always among other stipulations that the hospital authorities will carry out the autopsies wtih due reverence for the dead and they will deliver the corpses and all parts removed thereform to the burial society for internment after use."

—Editorial Jewish Medical Ethics *J.A.M.A.* 180:403, 1962.

The Management Of Congenital Cleft Lip And Palate Deformity

ROBERT A. CHASE, M.D.
New Haven

No parent is more distraught than one suddenly confronted with the fact that his infant has been born with a congenital cleft lip and palate. Advances in the pediatric and plastic surgical management of cleft infants have made it possible to honestly reassure such shaken parents in many respects. A primary obligation of the obstetrician and pediatrician is to furnish the reassurance to allay the resulting parental anxiety. The questions frequently encountered at the initial disclosure of the problem to the parent should be answered honestly and in a straightforward manner. The questions most frequently asked are the following:

1) *What caused the cleft?*

The cause for most congenital clefts of the lip and palate is unknown. Many facts have become clear through tedious statistical studies. It is generally an accepted fact that about one in eight hundred babies is born with a congenital cleft lip and/or palate.[6,17,19] Isolated cleft lips are most common in male infants in a ratio of two to one. Isolated cleft palates are most common in female infants by the ratio of two to one.[3] Nearly three-quarters of complete clefts of both lip and palate occur in males. The classical theory of the embryology of cleft formation was outlined by His in the 19th century. Doubt was cast upon this theory by Pohlmann in 1910[16] and echoed by Veau in 1931.[21,22] Recent studies by Stark have lent credence to the Veau theory of mesodermal penetration as the correct embryologic theory for cleft formation.[18] These facts have led Kernahan and Stark to suggest an improved classification for clefts of the lip and palate.[11] There is a significant tendency for the probability of the birth of a child with cleft deformity to increase with increased age of the mother.[12]

Etiologic factors in cleft production are under study in several institutions.[1,2,4,5,8,9,10,13,14] Clefts can be regularly produced in certain animals by embryonic environmental factors. Malnutrition, Vitamin E or B deficiency, irradiation and anemia have demonstrated etiologic roles in animals. In humans there has been no conclusive evidence for environmental etiology in the production of clefts. Apparently measles in early pregnancy is not a factor in cleft production in humans. The hereditary factors in cleft production are well-documented.

2) *Shall we have more children?*

In 1951, Ford reported that the risk of a second cleft child being born to normal parents is only 5 per cent.[7] If either of the parents has a cleft deformity, the chance rises to 15 per cent. There is no positive family history of clefts in 60 per cent of children born with cleft deformities. If neither parent has a cleft deformity, the likelihood of cleft deformity reappearing in a second child is so slim (5 per cent), that it seems reasonable to state the facts but urge the parents to have more children. In the presence of a strong family history, or a cleft in either parent, the statistical likelihood of a repeat cleft jumps to a significant 15 per cent. Under these circumstances, it seems logical to point out the odds and the current status of rehabilitation therapy available and let the parents decide for or against more children, based on the multiple other unknowns.

3) *Will the baby be able to take feedings?*

Cleft children usually do not have nutritional problems because they can rapidly adapt to the altered swallowing physiology. Frequently new-born cleft babies require dropper feedings, but as a rule they graduate rapidly to feedings using a nipple with enlarged holes.

This work was supported by U.S.P.H.S. Grant No. D-1200.

DR. ROBERT A. CHASE is Associate Professor of Surgery, Yale University School of Medicine, New Haven.

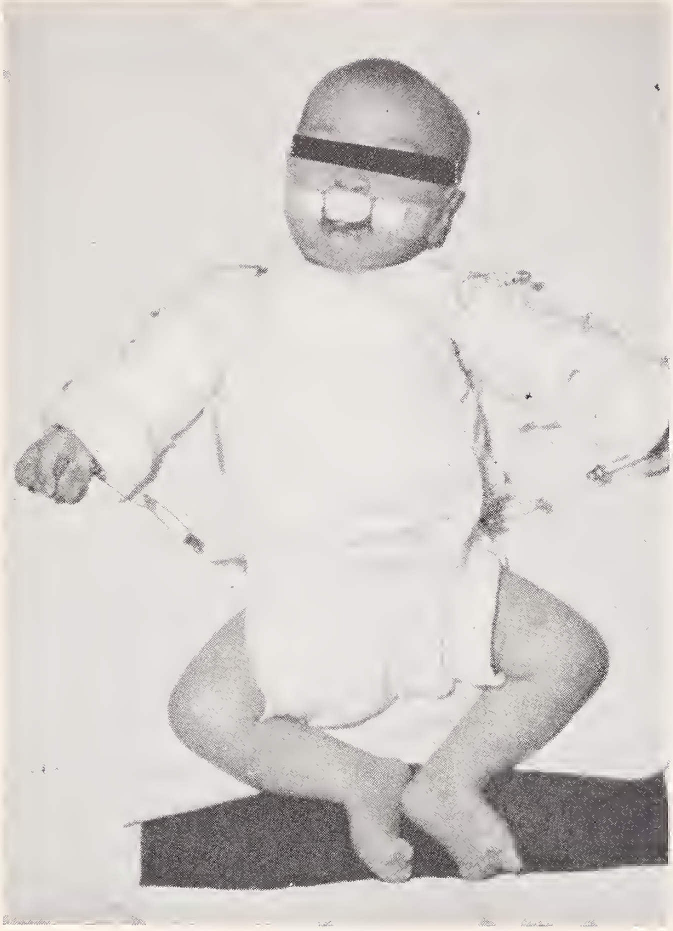

Figure I

Postoperative use of the Logan bow and damp fine mesh gauze dressing. Arm splints and pins prevent baby from disturbing his wound.

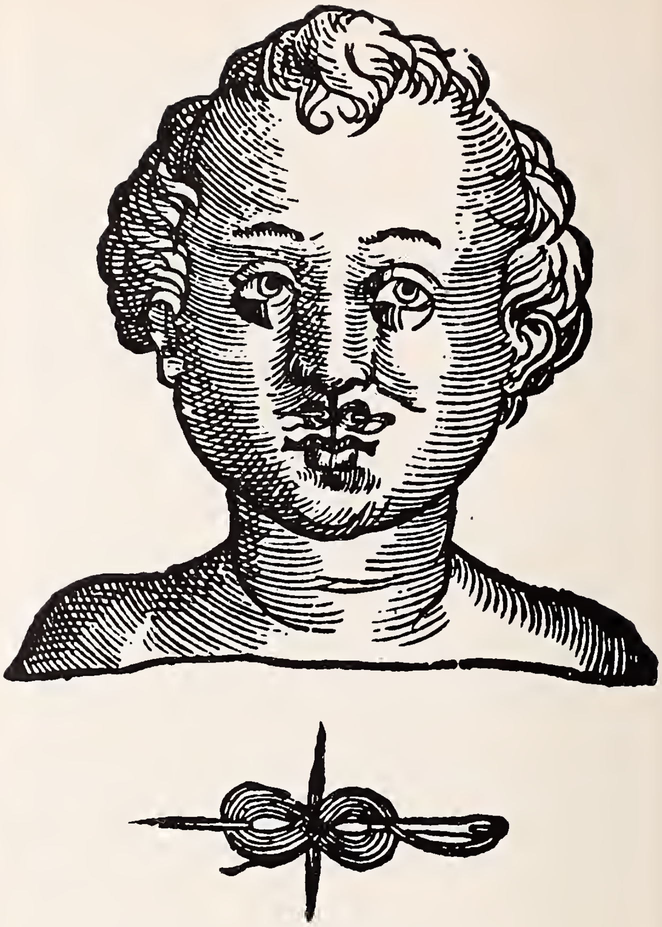

Figure II

From Pare 1572—Method of closure after freshening the edges of a cleft lip using thread wound in figure of 8 fashion over a needle transfixing the wound.

4) *May I breast feed my baby?*

Breast feeding may be perfectly successful even with wide bilateral clefts. Cinefluorography studies of breast feeding babies show the nipple to protrude well into the pharynx during feeding. If the mother is strongly motivated toward breast feeding her cleft baby, there is no contraindication and there is a possibility that such breast feeding can be perfectly successful.

5) *What can be done to correct the deformities?*

Historically, cleft surgery technics have become more and more successful as asepsis, anesthesia, antibiotics, and clear understanding of wound healing have developed. Repair of incomplete unilateral cleft of the lip can now be carried out with such accuracy that they may be barely identifiable as having had a cleft as years pass. The wide complete clefts and bilateral clefts can generally be repaired adequately so that most of the stigmata of cleft deformity are imperceptible.

6) *When will surgery be performed?*

Correction of the lip deformity will be done first, probably at about three months of age. Some plastic surgeons repair the lip in the first week of life. At three months of age, our experience has been that the infant can tolerate anesthesia and surgery better and the lip elements are a sufficient size to allow greater accuracy in primary closure. Timing of the palate repair is debated by several groups. It is a fact that in general the earlier the palate is closed, the better will be the final speech result. However, morbidity and mortality following palate closure in the very young infant is significantly higher than that when repair is done after the first year of life. About 70 per cent of children have near normal speech following cleft palate repair in the first two years of life.[20] This figure drops drastically to 26 per cent in the group with the repair in the third year of life. The logical choice of time for repair of the palate cleft appears to be between the ages of one and two years.

7) *What is the long-term outlook for correction of cleft deformities?*

With present technics of cleft lip repair the outlook for correction of the cosmetic deformity to near normal is high in the unilateral cleft lip group. In the wide bilateral cleft lip child the outlook for achievement of a cosmetically acceptable correction is good. There may remain some stigmata of congenital cleft but the development of new technics in late revisional surgery brightens the outlook for the eradication of such stigmata. Correction of the cleft palate deformity with resulting good speech performance can be expected in 70 per cent of patients suffering cleft palate disease. This does not mean that the remaining 30 per cent are not eligible for late reconstructive surgical maneuvers which will overcome the problem of nasal emission with speech. The development of pharyngoplasty, secondary palate pushback and pharyngeal flap procedures, and prosthetic speech devices, has opened the door for correction of palatopharyngeal incompetence.

Primary Cleft Lip Surgery—Preoperative Preparation Of Parents

In preparation for the surgical correction of cleft lip deformity, it is wise to teach the mother the technic of dropper feeding and feeding of her infant from the cup. If the infant is accustomed to such feeding by training in these technics, there will be a less severe feeding problem in the early postoperative period. The infant's nutritional state during the preoperative three months of life should be carefully monitored and kept at a high level.

Parents should be told that immediately following surgical repair of the cleft lip, the infant will be kept in the recovery room for an extended period and may return to the hospital room in a crupette. The baby's arms will be restrained by elbow splints to prevent him from handling the dressing and lip wound. As soon as the baby is awake, feedings will be started utilizing either a dropper technic or feeding directly from a small medicine glass. The baby will be kept isolated and mask and gown technic will be used by those individuals who contact him during the early postoperative period. The baby is likely to return with a Logan bow metallic brace-like device to remove tension from the lip wound and allow the use of changeable damp fine mesh gauze dressings. See Fig. I. Generally the lip stitches will be removed on the third postoperative day and the baby will be ready for discharge from the hospital in approximately ten days. The mother should be urged to learn to feed the baby with dropper or cup technic during the early postoperative period. The Logan bow will be removed shortly before discharge and the feeding regimen with dropper or cup should be continued at home for another two weeks before the infant is allowed to suck with its repaired cleft lip.

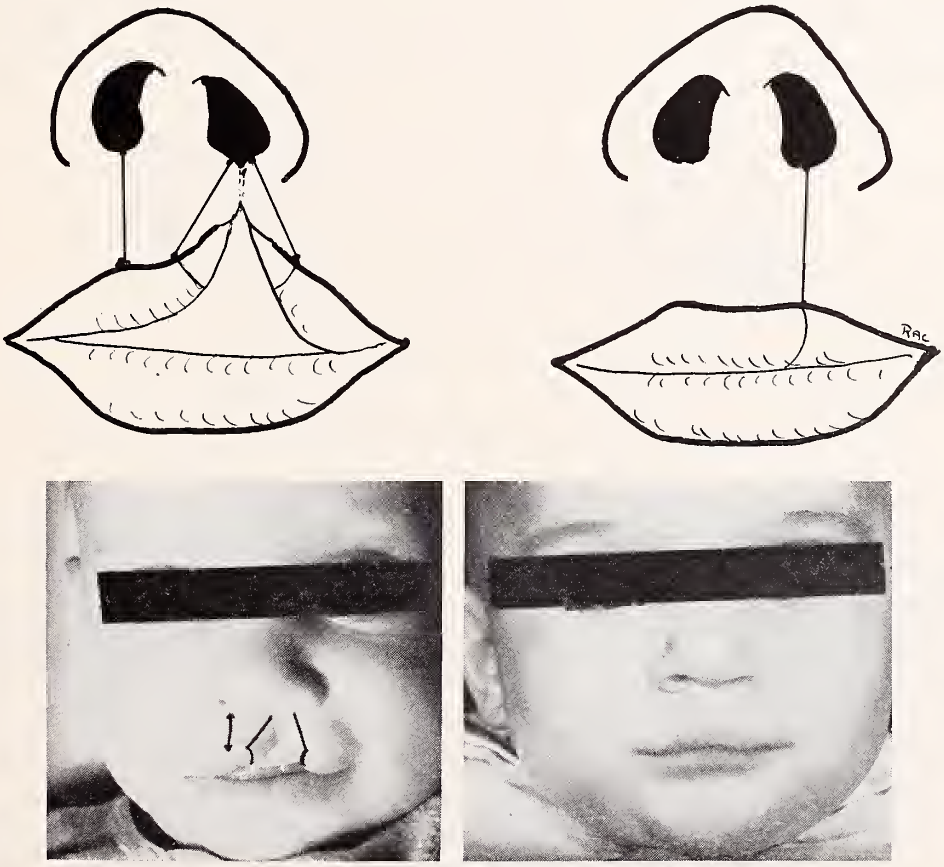

Figure III
The Rose-Thompson method of straight line closure in mild clefts of the lip.

Primary Cleft Palate Closure

When the cleft child reaches the age of one to two years, his primary cleft palate closure should be carried out unless a specific contraindication exists. A history of excessive bleeding during the first year of life should be thoroughly investigated before cleft palate surgery is performed. Upper respiratory infection in close proximity to the time elected for cleft palate closure contraindicates palate surgery. Children are not admitted for a cleft palate closure during the polio season. Following surgical closure of the cleft palate, the child's arms are restrained by elbow splints. Feedings of clear liquid only during the first forty-eight hours, followed by a full liquid diet with an after rinse of clear fluid during the next seven days, is routine. Following this period, soft foods followed by clear liquid rinses are allowed until three postoperative weeks have passed. After three postoperative weeks, a full spectrum diet is allowed. During the early postoperative period no small utensils or toys that can be placed in the mouth are allowed in the child's proximity. As a general rule, the child is ready for discharge from the hospital in approximately one week. In the postoperative period after discharge, he should be confined to the home for approximately two weeks, and exposure to upper respiratory infections must be avoided. An incomplete cleft palate is usually repaired in a single stage. Wide complete or bilateral clefts may require a two-stage closure with two periods of hospitalization separated by six months to one year.

Late Problems And Rehabilitation

The cosmetic defect which may result from wide clefts of the lip and palate usually require some late revisional surgery to help correct the nostril deformity and occasional disparity in lip length over that on the sound side. Some of these cosmetic deformities may be corrected at the time of the cleft palate repair. Major correction of nose deformities resulting from congenital cleft lip and palate should be left until nasal growth is nearly complete in the teen years. However, nostril size correction and lengthening of the fore-shortened columella may be carried out at the pre-school age.

The child's dental status should be carefully checked by a qualified dental specialist during the first several years of life.[15] Meticulous hygienic care of the teeth is important. The teeth may later be anchors for special orthodontic braces or prostheses especially important to the cleft child. Deviation from the normal anatomical dental pattern in the cleft area is largely correctible by proper orthodontia. Orthodontia is usually initiated at the preschool age level.

Children who continue to have nasal emission with speech following the primary cleft palate repair and speech therapy should be very carefully evaluated by multiple technics.[3] Currently under the auspices of the United States Public Health

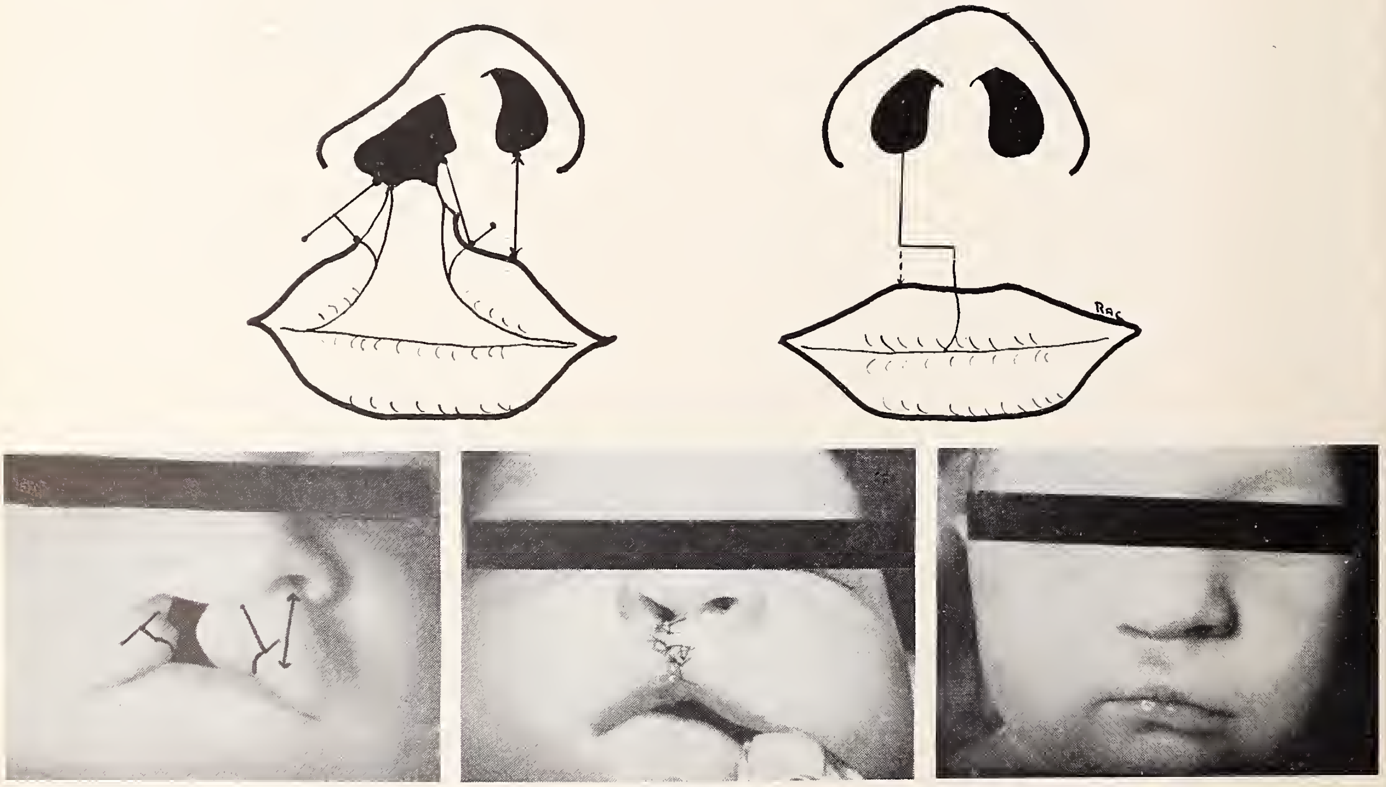

FIGURE IV
The Hagedorn-LeMesurier quadrilateral flap closure used when there is marked shortening of the lip on the cleft side.

Service, children with nasal emission in speech are being studied by a series of tests to evaluate the need for further corrective surgery. Children are subjected to physical examination, professional speech analysis, audiometric hearing studies, special respiratory studies and cinefluorography studies of palatal function. Following the analysis of the data collected from this series of studies, it is possible to logically suggest that the child with speech problems after cleft disease needs either further surgical intervention, a prosthetic speech device, or further speech therapy alone. The advances in late rehabilitation by prosthetic technics and surgical correction by pharyngoplasty, palatal pushback and pharyngeal flap have opened the way for correction of speech nasal emission in this group of palatopharyngeal incompetent individuals.

Plastic Surgery Technics For Primary Repair Of Congenital Cleft Lip Deformity

In the 15th century, Heinrich Von Pfalsbeundt described an operation specifically for cleft lip deformity, in which the wound edges were freshened and the wound simply closed. The great Ambrose Pare is credited with the first use of the term "Bec-de-Lievre" (harelip), a term which we are currently attempting to discourage. Pare described in detail the repair of cleft lip deformities. "For we so commonly see lips which are cleft from the first conformation in the womb by the error of the forming faculty." Ambrose Pare suggested repair of this cleft lip deformity utilizing a needle inserted across the cleft, the cleft edges being held together with waxed thread in figure of 8 fashion. See Fig. II. "Then wrap the thread to and over the ends thereof eight or ten times just after the manner that women fasten a needle with thread in it upon their sleeves or tailors to their hats or caps so they may not lose them. The needle thus fastened shall be there until perfect agglutination of the wound. . . . But such a suture will help nothing to agglutination if there remain any skin between the lips of the wound. Whereupon you shall cut away whatsoever thereof shall be there, otherwise you must expect no union." In 1843, J. F. Malgaigne first described the use of flaps for cleft lip closure. Malgaigne, who was agitated by the notch formation in cleft lip after closure, altered the technique by denuding the edges from above downward instead of from below upward. He preserved the long flaps which were left by such incisions and used them to fill the notch-like defect which had been a problem in cleft lip repair. In the 19th century, J. Marion Sims, in describing the use of silver wire

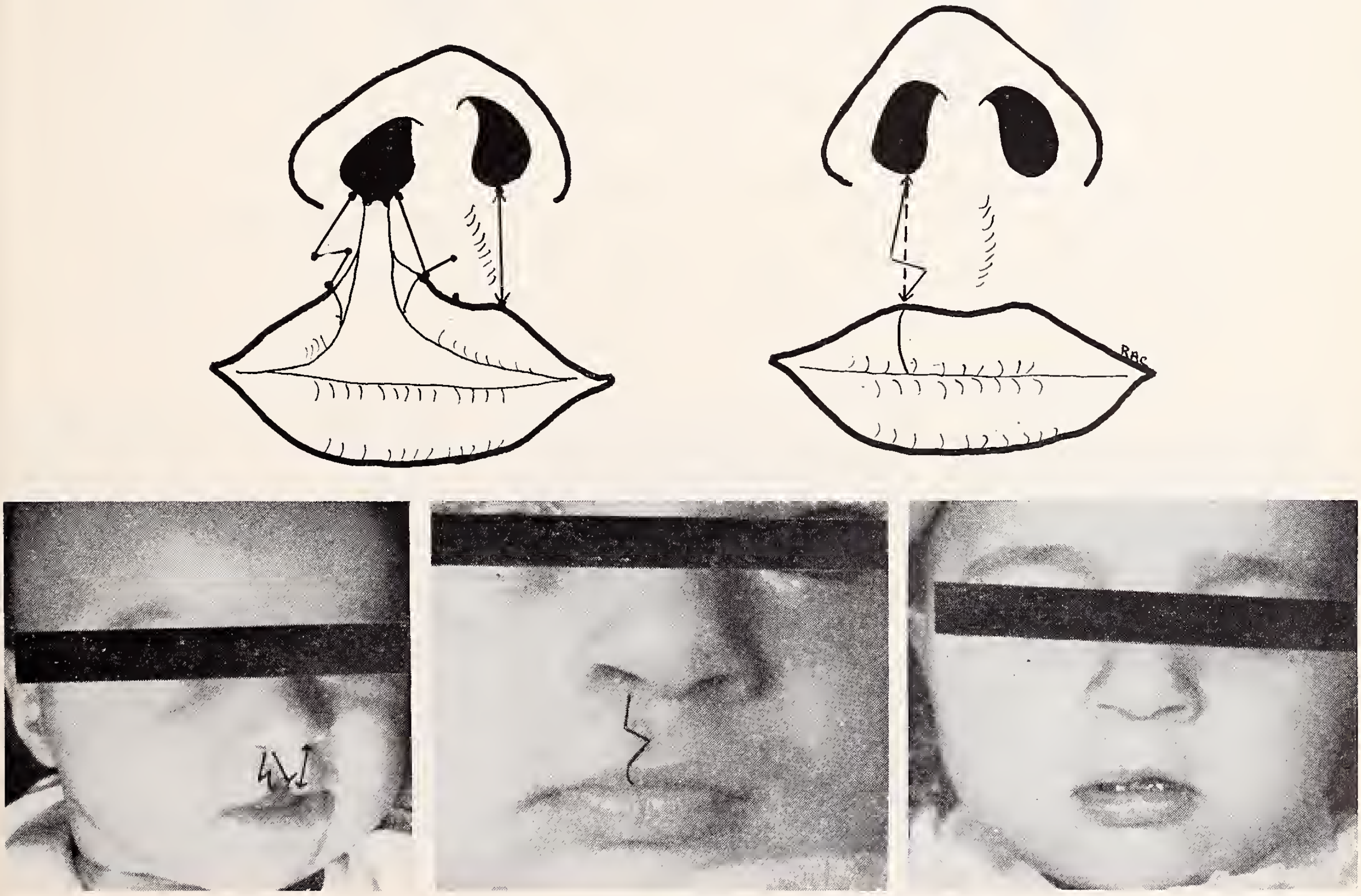

Figure V

The Tennison triangular flap method with a Z closure just above the vermilion border. The normal cupid's bow is preserved.

as suture material, said "In harelip the results of this suture are beautiful."

Mirault, in 1857, recommended simple sutures for the closure of cleft lip deformities. He devised flaps which were superior to those previously in use, and his operation was the foundation on which a series of most successful methods of lip closure has since been evolved.

Each of the technics named after Rose, Thompson, Brown, MacDowell, Hagedorn, LeMesurier, Tennison and Millard, using variations of the Z plasty flap technics, has specific indications. See Figs. III, IV, V. VI. Choice of which technic should be used depends in part on the nature of the cleft lip deformity and its severity.

Bilateral clefts of the lip and palate present an even greater challenge. The lip can generally be repaired in one stage with or without recession of the premaxilla. Recession of the premaxilla is done by osteotomy of the vomer avoiding injury to the vomerine growth center. Once the lip is repaired, it molds the premaxilla back into proper position. See Fig. VII.

Surgical Technics For Primary Repair Of Palate Clefts

Jacques Houllier was among the earliest to discuss cleft palate deformity and to suggest prosthetic replacement. In 1562, he suggested using sponge soaked in melted wax as a prosthetic replacement for cleft palate deformity. Shortly thereafter several other reports were made of the use of metal plates fashioned to fit the cleft deformity. Closure of clefts by surgical technics can be traced clearly back to Conrad Martin Langenbeck, who perfected a technic for surgical closure of cleft palate by making relaxing incisions in the mucoperiosteal tissues overlying the hard palate. With this resulting relaxation, the cleft could be closed by freshening the opposing borders. Diefenbach, vonGrafe and Billroth all contributed technical advances in cleft palate closure. Accepted technics in general use today for closure of palate clefts and simultaneous lengthening are variations of the Veau operation or the Dorrance pushback procedure. When palatal length is apparently sufficient before primary palate closure, the old vonLangenbeck technic may be

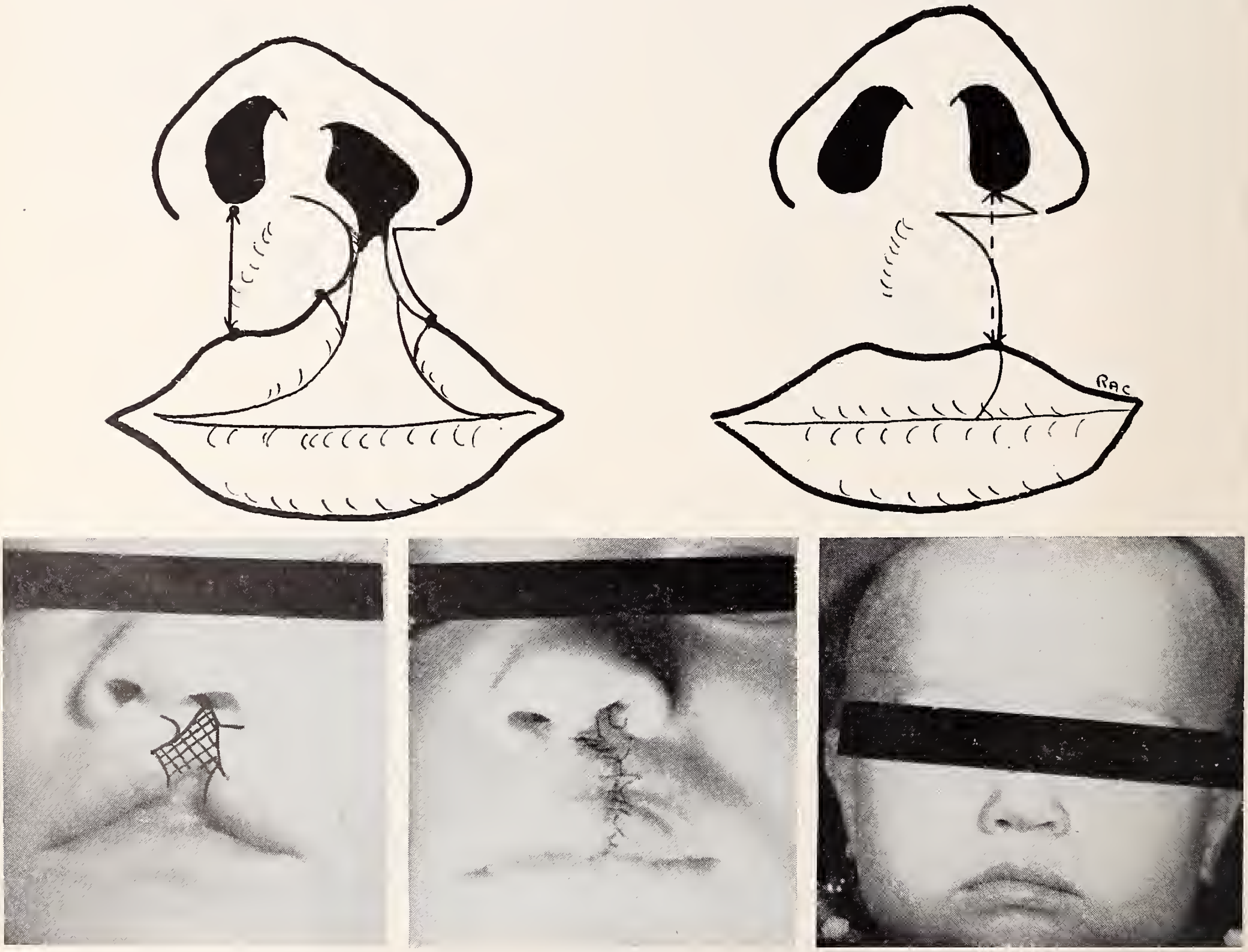

Figure VI

The Millard technic creates a rotational Z closure just beneath the nostril, preserves the cupid's bow, and places the scar in the normal philtrum line.

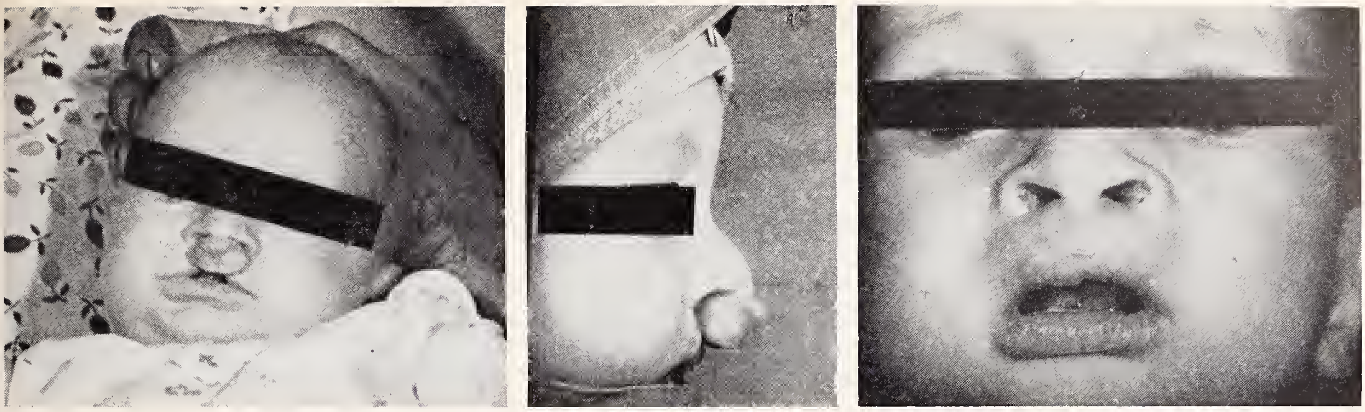

FIGURE VII

Bilateral complete cleft lip and palate. Note protrusion of premaxilla. Lip repaired after recession of premaxilla.

acceptable for palate closure. In a large percentage of patients, the palate is quite short and for that reason palate lengthening at the time of primary closure is indicated in the majority of instances. Description of the details of palate pushback technics are beyond the scope of this paper.

Summary

Management of the infant with cleft lip and palate deformity has been outlined.

A primary obligation of the obstetrician, pediatrician, and plastic surgeon is to reassure and allay parental anxiety following the birth of a cleft child.

The basis for a logical answer to questions most frequently asked by parents of a cleft child has been presented.

The regimen for the management of the cleft child at the time of lip surgery and preparation of parents has been discussed.

The pre and postoperative management of a child undergoing cleft palate surgery has been outlined.

Late problems following correction of congenital cleft lip and palate and the cosmetic and speech rehabilitation technics have been discussed.

The multiple technics for cleft lip reconstruction and their application have been demonstrated.

Acknowledgments

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A Basic Physiological Approach To Myocardial Revascularization

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A variety of approaches have been used in the past in an effort to develop a satisfactory surgical treatment for coronary artery disease.[1,2,3] The approach being presented consists of an attempt to add more blood to a distal coronary arterial tree through collateral channels from an extracardiac source. This paper is a summary of several dozen series of experiments which have been performed on about 350 dogs for study of the problem.

Basic Hypothesis

The experiments were designed after a thorough review of the literature on the development of collateral arterial channels in the body in general. A "common denominator" was found to be present in all situations in which collateral channels developed. On the other hand, the presence of this "common denominator was found to consistently lead to the development of collateral arteries. The "common denominator" consists of a situation which includes three conditions. These are: (1) a high pressure donor artery which meets certain requirements, (2) a low pressure recipient artery, and (3) a pre-existing vascular communication between these two. The hypothesis being proposed states that collateral arteries can be expected to develop in any situation, but only in a situation in which the three requirements of this "common denominator" are met.

This hypothesis may be considered in relation to the clinical coronary problem. Theoretically, a large artery in a pedicle can serve as the donor artery required by the hypothesis, and a coronary artery with low pressure distal to an obstruction can serve as the recipient artery. There remains the problem of the third requirement, which is the pre-existing vascular communication. Each requirement will be considered in detail.

1. The Normotensive Donor Artery

Experiments on various types of pedicles were done on 164 dogs, in order to study conditions which favorably influence the development of collateral arteries. Several factors turned out to be important.

(1) The donor artery must be large so that it can deliver large quantities of arterial blood, and maintain a high pressure at the point of delivery.

(2) Continuous outflow from the artery from the very beginning appears essential, so that the vessel does not become a blind pouch with eventual obliteration of the lumen. Inclusion of connective tissue and vein in the pedicle provides an adequate runoff bed from the artery which fulfills this requirement, and completely avoids thrombosis or other occlusion of the lumen.[3]

(3) Multiple potential sites for collateral channels to arise from the donor artery seem important, because it appears that a number of moderately large collateral channels should be expected rather than a single large one.

(4) Furthermore, it seems wise to implant the donor artery in a clean incision in the myocardium at a point near a moderately large coronary branch. The development of a collateral artery appears to be related to the pressure gradient per unit length of collateral, and therefore a shorter potential collateral has an advantage.

A pedicle was developed which is believed to fulfill these requirements. It consisted of the mammary artery and vein and the adjacent connective tissue and muscle. The muscle was removed from the distal end of the pedicle. This end was inserted in a flat tunnel 2 to 3 millimeters beneath the surface of the myocardium. An effort was made to place it under a branch of the anterior descending artery (Fig. I).

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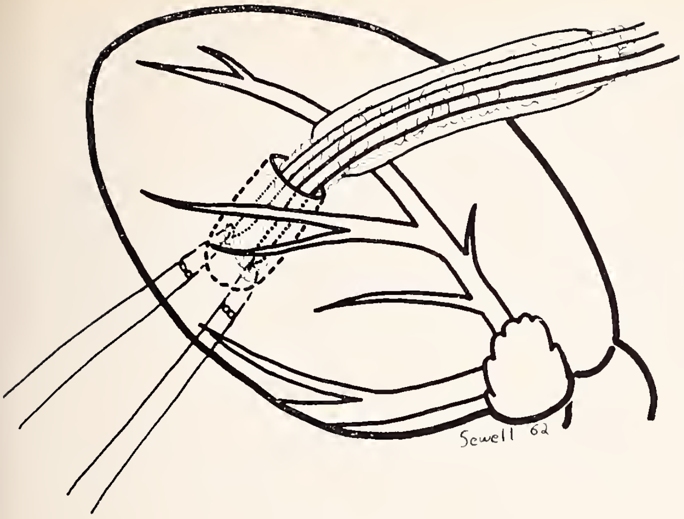

FIGURE I

Diagram of the way the pedicle is pulled by sutures into a flat tunnel cut beneath the surface of the heart. The pedicle is made from the mammary artery, mammary vein, surrounding connective tissue, and a portion of the sternocostalis muscle. It is placed under a moderately large branch of the anterior descending, so that collateral channels between the mammary and coronary arteries will be as short as possible.

2. *The Hypotensive Recipient Artery*

Attention may be directed to another of the three requirements of the "common denominator" hypothesis. Techniques were developed for measuring the pressure in a distal coronary artery. Although production of a chronic coronary arterial hypotension may appear to be a relatively simple matter, it turned out to be extremely difficult and took years of experimentation.

Experiments on 35 dogs[4] showed that a short constriction must reduce the lumen of a coronary artery to below about 15 per cent of its original cross sectional area before collateral channels will develop to that artery. Reduction of the lumen to between 4 per cent and 15 per cent of normal stimulated the formation of moderately large collaterals. Reduction below 4 per cent resulted in large collaterals in the survivors, but also caused a high mortality. These experiments are interpreted as showing that strong stimulation of the development of collaterals to a coronary artery requires reduction of the lumen to between 4 per cent and 15 per cent of normal at the time of surgery, with later gradual complete occlusion. Enough collaterals develop during the initial period to permit the later obstruction without mortality or infarction.

A procedure was finally developed for doing this satisfactorily. It utilized a cylinder of Ameroid which was enclosed in a polyethylene casing, except for one end. A wire was passed around the device near the closed end and also around the coronary artery. It was twisted at the time of surgery until the distal pressure indicated that the desired degree of hypotension had been obtained. Postoperatively, the Ameroid began to swell at the open end as it absorbed water and the swelling progressed gradually toward the closed end as water soaked it farther. The constriction remained stable until the swelling reached the location of the wire. It then gradually tightened and eventually occluded the artery.

This device has been applied to the anterior descending artery of over 100 dogs, and is found to be well tolerated. It produces a strong stimulation for the development of collateral arteries.

3. *Initial Vascular Communication*

In situations in the body in general where collateral arteries develop, the initial vascular communication could have been, and probably was, present since birth. An example of this would be collateral channels around a segmental obstruction of the femoral artery. However, the only possible initial communication between a pedicle and the heart is a microscopic vessel in granulation tissue across a suture line. A crucial question, therefore, is whether these microscopic vessels can develop into satisfactory collateral arteries.

Experiments were performed to answer this question.[5] The thigh of each of eight dogs was amputated at the midlevel, except for the femoral artery, femoral vein, femur, and major nerves. The soft tissue was resutured and the femoral artery was ligated at the same level about three weeks later. A large number of collateral arteries developed, and their lumens reached a maximum of 1.0 mm. in diameter. The distal leg was satisfactorily nourished, and each dog was able to walk normally. These experiments are interpreted as showing that newly formed microscopic vessels in granulation tissue across a former suture line can develop into satisfactory collateral arterial channels.

Further experiments were done in order to study factors which influence the favorable development of these initial vascular communications. Agents such as talc, silver nitrate, trichloroacetic acid, sodium morrhuate, Sodium Sotradechol, Varisol, croton oil, caster oil, and mechanical abrasion of the epicardium were tested. The results showed that all of the irritating substances led to a more or less unhealthy granulomatous reaction and the vascularization was poor. The best vascularization was obtained when a clean incision was made in the myocardium and the tissues were sutured neatly together without irritating substances. These findings do not seem at variance with basic surgical principles of wound healing.

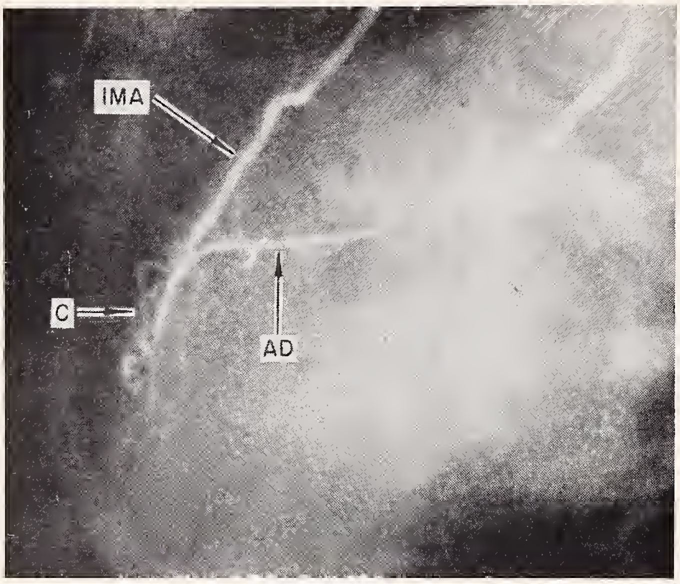

FIGURE II

A pedicle was placed on the heart, and experimental chronic coronary arterial insufficiency was produced in the anterior descending artery 5 weeks later. An arteriogram was taken using a retrograde injection of radiopaque medium into the distal subclavian artery 13 weeks later. IMA—Internal mammary artery. C—Collateral channels. AD—Anterior descending.

Experimental Testing Of The Hypothesis

Having shown that it was possible in theory to meet the three requirements of the hypothesis, experimental confirmation was sought by implantation of a pedicle in the manner described in a dog with chronic coronary arterial hypotension. The results were evaluated by Vinylite corrosion casts and by cinearteriography. The corrosion casts gave a good anatomical demonstration of the lumen of the donor artery, the collateral, and the recipient coronary arterial bed. The cinearteriogram demonstrated the size, direction of flow, and velocity of movement in these vessels.

Collateral channels from the donor artery to the coronary arterial system were found to develop consistently when a pedicle of the type described was applied to the heart of seven dogs with effective chronic coronary arterial hypotension, and the cinearteriograms demonstrated flow from the mammary to the coronary arteries of all of these dogs (Fig. 2).

Clinical Application

Collateral arteries similar to those found in the animal experiments could probably be expected to consistently develop from a pedicle of the type described to the coronary arterial system of patients who have chronic coronary arterial hypotension. Accurate identification of these patients may or may not turn out to be a difficult problem of the future.

A 46 year old white male veteran was found with a two year history of angina pectoris. Coronary cinearteriography showed numerous filling defects and marked reduction in the velocity of movement in the right coronary. The distal half of the anterior descending and the entire posterior descending failed to opacify.

A pedicle of the type described in the dog experiments was implanted on May 3, 1962. The postoperative course was uneventful, and he has been symptom free since surgery. However, objective evaluation will have to await mammary cinearteriography several months postoperatively.

Summary

An hypothesis is presented which states that collateral arterial channels can be expected to develop in any situation which includes a suitable high pressure donor artery, a low pressure recipient artery, and an initial vascular communication.

Experiments showed that a microscopic vessel in granulation tissue across a suture line can serve as this initial communication.

Chronic coronary arterial hyotension turned out to be extremely difficult to produce in the dog, but was eventually achieved using an original plastic device containing Ameroid.

Experiments revealed several necessary requirements of a suitable donor artery. A pedicle which was made from the mammary artery, mammary vein, surrounding connective tissue and muscle was demonstrated to meet these requirements.

Pedicles of this type were applied to dogs with chronic coronary hypotension and the results were evaluated with cinearteriography and corrosion casts.

The hypothesis is believed to have been tentatively confirmed in the situation studied. Large collateral arteries consistently developed and carried blood from the pedicle to the coronary arterial system.

The pedicle operation was performed on one patient. The early result is good, but objective evaluation will have to await postoperative mammary cinearteriography.

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Shock And Its Treatment

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Semantics

THE patient is said to be in shock if he appears ill, has cold, pale skin which is perspiry under certain circumstances, has a low systolic blood pressure and narrow pulse pressure, an elevated rate of the pulse and complains of thirst. These are fairly constant findings, although on occasion some may be absent. Many of the clinical findings are secondary to vigorous vasoconstriction as a reaction to a deficit of circulating blood. In all cases there is an inadequate volume of blood in the arterial tree relative to the size of it. The microcirculation is inadequately perfused.

It is apparent that the clinical diagnosis of shock presents no difficulty, and this very fact presents a problem, namely that one can make a diagnosis of shock with no reference to the mechanisms causing it. The clinical picture which the most inexperienced person may recognize without difficulty can result from a variety of causes which must be determined before rational therapy can be applied. The treatment of shock resulting from one basic abnormality may be quite contrary to that which results from another. But, while the end results of this pathologic physiology which causes that complex of signs and symptoms clinically called shock are easily recognized, the cause for the abnormality itself is often difficult to detect. For a given patient in shock, is the fundamental problem a "cardiogenic" one of backward failure; is it one of overwhelming infection with its own complex of concomitants; is it one of neurogenic vasomotor paralysis; or is it a problem of absolute oligemia? If we concern ourselves with the last of these possibilities does the oligemia reflect an absence of whole blood from the circulation, or does it represent a loss of the plasma component alone? Despite our many laboratory aids, the diagnosis of the mechanism of shock in a particular patient is not always an easy matter. Of primary importance is the history and physical examination, the former often more important than the latter.

Because of these difficulties in arriving at an etiologic diagnosis for a patient first seen in shock, and because there is obvious danger in mistaking one mechanism of shock for another, attempts have been made to devise a better terminology, more descriptive of the clinical status of the patient in shock. Grant and Reeve,[1] on the basis of an extensive experience, have suggested such terms as "cold tachycardia," "warm tachycardia," "cold hypotension," and other patterns descriptive of the circulatory status of the patient. However, this approach to the problem does not relieve us of the responsibility for detecting the underlying cause or causes of the circulatory disturbance if we are to apply appropriate therapy. We have observed a patient who, following perfusion of the lower extremity and pelvis with nitrogen mustard, developed "warm hypotension" and tachycardia. At re-operation he was found to have at least three liters of blood within his abdomen, representing more than half his estimated blood volume. He probably would have had "cold hypotension" if he had not been perfused. Nevertheless, his case emphasizes the fact that the physical examination must be interpreted in terms of the history and other findings before one can be certain of the underlying abnormality in a given patient.

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This being the case, we believe it would be best to retain the time-honored word "shock" for an easily recognized clinical state, so long as we teach that rational therapy must be based on a deciphering of the mechanisms involved. In clinical medicine this is not peculiar to shock. Rational therapy depends upon a detection of responsible mechanisms in ulcerations of the stomach, in colitis, pneumonia, and other conditions. Let us then use the word "shock," but in doing so let us be sure that we define what we are observing and that before adopting a course of therapeutic action we have exerted every effort toward understanding the mechanisms which have led to the condition. Only in this manner can rational therapy be applied.

Principles Of Therapy For Oligemic Shock

I now would like to consider therapy in relation to patients in shock as seen in our accident rooms, in our operating rooms, and on our surgical wards. To be sure, there is no law which forbids surgical patients from falling heir to the same problems which cause shock among medical patients and vice versa, but by and large, the most common cause of shock as seen by the surgeon is loss of blood volume from the vascular system, i.e. an absolute oligemia. This deficit in blood volume may be due to hemorrhage into the exterior, into the body cavities, or into the tissue planes. Or the oligemia may be due to massive leakage of plasma-like fluid, both exudate and transudate, into the body cavities or into the interstitial spaces because of increased capillary permeability. Ths latter can result from injury caused by chemical agents (gastric and intestinal contents); by bacterial agents (infectious peritonitis or pleuritis, hemolytic streptococcal, or occasionally staphylococcal, infections of the extremities and other parts of the body); by prolonged ischemia with reëstablishment of the circulation (the "Crush Syndrome"); or by physical injury such as heat or cold. Probably second in importance to the otherwise uncomplicated oligemia among surgical patients are the toxemias, the endotoxemias arising from bacterial proliferation and from the decomposition of blood and gangrenous tissue. These are the common conditions which the surgeon must consider when he recognizes shock in one of his patients. As aids in diagnosis, the percentage of hematocrit and the effective volume of circulating blood can be measured quite expeditiously. To be sure, the patient who has lost blood or plasma will show a deficit in the effective circulating blood volume; the patient who has lost whole blood will show hemodilution; the one who largely has lost plasma will show hemoconcentration. But these findings are not always clear-cut or discriminative. On last analysis, the surgeon, or the internist for that matter, must rely on a meticulous history and physical examination in order to arrive at a diagnosis and a rational program of therapy.

Shock Versus Hemorrhage

Any discussion of the treatment of oligemic shock must take into account the fact that neither hemorrhage nor oligemia are truly synonymous with clinical shock. The clinical picture is compounded by the readily discernable apprehension and pain. Medications administered before the clinical picture of shock has become apparent modify the findings. Also influencing the clinical picture is the presence of an open wound especially with the opportunity for the absorption of toxic products if left untreated for several hours. The treatment of shock must include the allaying of apprehension, the control of pain by splinting or by medication, although the latter is often not necessary[2], and the treatment of the wound itself. These are all elements of the early treatment of wound or traumatic shock, often called "resuscitation." As observed during the First World War, prompt appropriate surgical treatment of the wound should be considered a part of resuscitation. While these factors are important, the fact remains that the essential feature of this kind of shock is the oligemia and it is this which must be corrected by restoring the effective circulating blood volume at least to a level at which the activity of compensatory physiologic mechanisms evoked by the oligemia begins to subside.[3] In most cases this is achieved by the administration of whole blood.

Early And Advanced Stages Of Shock

Oligemic clinical shock can be divided into two stages; an early one from which recovery is expected and a late stage from which recovery has become unlikely or impossible with our present methods of therapy. Treatment of the first stage consists of:

1. Assurance of an airway and administration of oxygen. Hypoxia must be avoided.
2. Replacement of intravascular fluid by means of whole blood in the majority of cases.
3. Control of bleeding. There is little value in any therapy if bleeding, apparent or occult, is allowed to continue.
4. Elimination of apprehension and pain. When medication is needed, it is best administered intravenously instead of subcutaneously.
5. Splinting of fractures, the best treatment for pain in such cases.

6. Control of insidious bleeding and of oozing by means of the simplest possible surgical measures.
7. Trendelenburg position when it does not interfere with respiration.
8. Bandaging of limbs to decrease the capacity of the vascular tree.
9. Appropriate direct surgical therapy for the wound.

These are items about which there is general agreement because their effectiveness has had ample demonstration. Certain auxiliary measures are advocated by some, but are believed to be of doubtful value in this stage. These include the use of vitamins, such as the B-complex, the administration of substances which inhibit metabolism, and the use of autonomic blocking agents or of vasopressor substances.

Vasopressors And Shock

Vasopressors are in common use for the treatment of shock, in both the early and in the late stages. These agents do raise the blood pressure in most hypotensive patients. But they do so, for the most part by increasing the total peripheral resistance. This is achieved by constriction of the small arterioles and venules. Whether or not the large veins which serve as reservoirs are affected is not known with certainty. In any event, we must note that the business of the circulation is conducted in the capillary loop where a certain hydrostatic pressure is essential, as well as a gradient in pressure between the arterial and venous end of the capillary. The effect of arteriolar constriction would be to decrease the already diminished rate of blood flow in the capillary loop. Venular constriction might increase the pressure within the capillary but would probably decrease still further the rate at which blood would flow through the capillary. Some have recently advocated the use of angiotensin for the treatment of shock[4,5]. So far as one can judge from the reported clinical experiences, the effectiveness of this powerful vasoconstrictor remains to be demonstrated.

The deleterious effects of shock result from a metabolic disturbance within the cells. A shift occurs from aerobic to anaerobic metabolism resulting in the accumulation of fixed acids, depletion of available base, and a drop in the pH from the normal of 7.4 to values of 6.9 or even lower in extreme cases. With this serious derangement in the internal environment, there is a failure of energy production. It is possible that the relative and absolute intracellular acidity denatures proteins and destroys enzyme systems. However these effects may be brought about, it is clear that on last analysis, they are caused by a decrease in the rate at which blood brings oxygen and foodstuffs to the cells and removes from them the products of metabolism. In the usual situation, it is difficult to understand how benefit can come from the employment of an agent which acts by increasing the peripheral resistance and therefore diminishes still further the rate of tissue perfusion. One can argue of course, that the rise in blood pressure is relatively greater than the vasoconstriction in some vascular beds and that a net increase in the rate of capillary perfusion results for those beds, but, except for the myocardium and possibly for skeletal muscle, evidence for this is lacking.

It is generally recognized that in response to a variety of stimuli, different vascular beds react differently from one another both in degree and in sense. Thus, with certain doses of epinephrine the circulation of the skin of the digits may markedly decrease while that of skeletal muscle increases. The vessels of the digits constrict violently in response to sympathomimetic amines, while the vessels of the trunk may not constrict sufficiently for the reaction to be detected. The relative sensititivities of vessels in the different vascular beds are not known. The myocardial circulation is clearly increased after norepinephrine and there is some increase in the circulation of skeletal muscle. Whether this truly represents an active vasodilation or just a secondary result of a direct vasoconstriction is not entirely clear. What is certain is that the administration of vasconstrictor agents does not prevent the development of, or reverse promptly, the metabolic derangements in cardiac muscle which result from prolonged oligemia and hypotension.

All organs and tissues present a certain resistence against the flow of blood through them. It can be argued, of course, that when the mean systemic blood pressure is lower than the closing pressure in an organ, blood flow through that organ will cease. Would it be reasonable to administer a vasopressor at least to make the mean arterial pressure equal to, or just greater than, the closing pressures in vital organs? In order for this argument to be valid, we must assume that when the mean arterial pressure has fallen below the critical closing pressures of some organs it is still sufficiently higher than the closing pressures of other organs to permit perfusion in those relatively unnecessary organs. The vasoconstrictor might then increase the resistance in the latter group of organs, diminishing the blood flow through them and thereby raising the mean systemic arterial pressure to the point of permitting some flow in those tissues with higher closing pressures.

The blood pressure could be raised by constrictor agents which would decrease the capacity of the main venous channels or of the aorta and large arteries thereby providing more blood for the cardiac output. While some data are suggestive, the evidence for this and for the effect on tissue perfusion is not entirely clear. This is highly speculative. It is true that in experimental animals, the rate of blood flow in the brain can be increased from the rate existing at extremely low levels of systemic blood pressures. At higher initial levels, however, the rate is decreased. Similarly, there is the occasional case in which the administration of norepinephrine or metaraminol does result in urine formation in the hypotensive anuric patient. These are uncommon situations. When such urine formation is demonstrated experimentally, it does not bear a direct temporal relation to the administration of a vasopressor. The significance of this is not clear.

There is risk in the administration of pressor agents. Arrhythmias are produced which, at least experimentally, are fatal. But even more important, is the fact that more often than not, resort to the use of vasopressors may commit an act of omission. Though the physician, after bringing the blood pressure back to normal or to near-normal is satisfied that all is well, the patient may be dying of oligemia and of poor tissue perfusion. This is treating the blood pressure and not the patient. It would be wiser to assess the state of volemia in the patient either on the basis of the history or by determination of the circulating blood volume by any of the indicator-dilution methods. The administration of whole blood is the best method for correcting oligemia. In situations where there has been loss of plasma instead of whole blood, the administration of plasma may be preferable. Low molecular weight dextran is useful where blood may not be available. When none of these is available and oligemic hypotension exists, I would prefer the use of crystalloid solutions until blood or colloidal solutions do become available. I would reserve the use of vasoconstrictor agents for conditions in which the basic abnormality is not an absolute oligemia but a relative oligemia due to loss of vasoconstrictor tone as occurs in high spinal anesthesia, after extensive sympathectomy, or in certain infections. Similar considerations apply to the use of the usual vasopressors in the "cardiogenic shock" of coronary thrombosis. Vasopressors may be useful in the type associated with a fall in the peripheral resistance; in that associated with an increased peripheral resistance, usually with congestive failure, vasopressors are not useful and may in fact, be harmful.

Shock Prolonged Beyond The Stage Of Ready Recovery

Shock is a dynamic phenomenon. It is never static and cannot be compared to suspended animation. The circulation and the metabolic derangements caused by its depression are always either improving or worsening. There comes a time when the derangements have become so severe and have lasted so long that recovery of certain cells becomes impossible, in the present state of our knowledge, and the cells die. When enough vital cells have died, the entire organism dies. This stage is commonly referred to as "irreversible shock," but it should be emphasized that it is not the shock which is irreversible; it is the death of cells which is final. Indeed, the death of some cells becomes apparent only long after shock has been corrected. Some cells of the kidney may be dead despite complete recovery of the blood pressure. When such a patient becomes oliguric and then anuric, he may actually develop hypertension. We are not dealing here with a matter of theoretical importance only. If we use the term "irreversible shock" to mean cellular death, then there is no quarrel except that the term is clumsy. The important point to bear in mind is that when shock fails to respond, more commonly than not, we are dealing not with cellular death, but rather with our having overlooked some element in the mechanism of shock.

The nature of cellular death as the result of inadequate tissue perfusion and the places where this cellular deterioration occurs are not known. The accumulation of endotoxins which are not neutralized by a reticuloendothelial system, rendered powerless by prolonged shock, has been suggested as a cause of "irreversibility." The evidence for this is not clear. Our belief is that the severe intracellular metabolic acidosis resulting from inadequate perfusion so injures the vital intracellular processes that the cells die and can no longer be resuscitated. Which organ or tissue first fails is not known. The data suggest, however, that in the previously normal animal the major deficit after prolonged oligemic hypotension and inadequate tissue blood flow is in the venous return to the heart.

Therapy For The Advanced Stages Of Shock

Unlike the shock of short duration, the treatment of which is reasonably well understood and standardized, the treatment for shock which has been unduly prolonged is open to wide differences of opinion. This is natural since the fundamental abnormality which makes recovery unlikely in this stage is not known. Once the biochemical disturbance which makes it impossible for cells to develop free energy for carrying on their work has become clear, we may be able to prevent development of the derangement and then correct it when it does develop.

In the meantime, many techniques, in addition to those used for the early stage, have been advocated for treating patients in this stage of shock: vasopressors, autonomic blocking agents, hypothermia, vitamins, substances which inhibit metabolism such as the chlorpromazines, and a variety of other agents. Their very number would indicate that none is a panacea. While a detailed review would not be profitable at this time, a few comments may prove worth while.

First, faced with the problem of irreversibility, one must make certain that he is not overlooking some unsuspected cause of shock, other than blood loss, such as:

1. Massive pulmonary atelectasis.
2. Tension pneumothorax.
3. Pulmonary embolism.
4. Fat or air embolism
5. Coronary thrombosis
6. Cardiac tamponade
7. Overwhelming infections:
   a. Intraperitonal sepsis
   b. Hemolytic streptococcal infection
   c. Staphylococcal, meningococcal and other "gram negative" infections
   d. Clostridial infection
8. Intracranial injury*

Second, we must make sure that replacement therapy is adequate and effective. To be in severe shock a previously healthy person may have lost half or more of his blood volume, i.e., three or more liters of blood.[6] Transfusion of only 500 cc. of blood can have little effect under such circumstances. We must be certain that blood is not leaving the circulation as fast as we are putting it in, or faster. Large volumes of blood can be concealed in the pleural cavities, in the abdomen and pelvis, and in the tissue planes of the thigh. Open wounds can ooze very insidiously so that large volumes can be lost without becoming readily manifest. How does one know that the reason for the failure of a patient to respond is not continued oligemia for any of these reasons? A simple and effective way is to monitor the central venous pressure. A low venous pressure suggests that more fluid is needed within the circulation; a high venous pressure would indicate that little good can come from injecting more blood or other liquid into the circulation. This would be the case in air or fat embolism, in pulmonary atelectasis and tension pneumothorax, and in pulmonary arterial embolus. In such cases, one must depend upon maximal oxygenation of the blood, and should right-sided heart failure develop phlebotomy may be necessary.

When the physician has ruled out these causes for failure of resuscitative measures, then and only then is he justified in considering "pooling" of blood in venous reservoirs or elsewhere as a cause for failure. In "endotoxic shock," beneficial results have been reported[7] from the use of vasoconstrictor agents, including angiotensin, in conjunction with corticosteroids in truly large doses, equivalent in man to 1.5 to 2 grams of hydrocortisone in the course of a day. The use of vasoconstrictors alone may reasonably be questioned in this kind of shock in view of the possible role of the catecholamines in its pathogenesis[8] as well as for reasons already discussed. Experimentally, in shock caused by the administration of endotoxin, some protection has been provided by the use of aldosterone[9] as well as by the administration of hydrocortisone. These agents may be worth trying clinically when everything possible has been done toward the control of the infection in septic shock and when all else fails in prolonged shock due to wounding and oligemia. At best, mortality is high in this kind of shock because its basic mechanism is not yet understood.

Much more work is needed on the problem of shock, especially in the stage where the accumulated deficit of perfusion has become too great to permit recovery. We may be encouraged by the fact that more work is in progress on this question at the present time than in any other peace-time period. A certain stimulus for this trend is the fact that as disease comes under control, trauma assumes greater relative importance. Therefore, it is well for the physician to keep abreast of advances in our understanding of these matters so that he may apply them effectively to his management of patients who have incurred trauma and are in shock.

Summary

The clinical diagnosis of shock is made from signs and symptoms which result when blood in the arteries is insufficient to permit a satisfactory head of pressure and perfusion of the capillary circulation. A metabolic acidosis develops and progresses until lethal if the underlying abnormality is not corrected. Although deficient per-

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* Unconsciousness is not a clinical feature of shock except terminally in previously healthy individuals. When present, the patient almost always has intracranial injury or infection.

fusion of tissues is common to all forms of shock, the mechanisms which lead to shock can differ widely between one patient and another. Rational therapy depends upon detection of the responsible mechanisms.

Among surgical patients, the most common single cause for shock is oligemia, usually secondary to the loss of whole blood, but sometimes secondary to the loss of plasma, as in burns, the "crush syndrome," and in certain infections. The details of therapy differ in the various forms of oligemic shock, but the need for restoring a normal effective circulating blood volume is common to all. Maintenance of adequate pulmonary ventilation is essential, as is the care of the wound when present. The oxygen carrying capacity of blood can be enhanced by the administration of 100 per cent oxygen. The Trendelenburg position is recommended to minimize the volume of blood deployed into the extremities.

In the early stage of shock, normal hemodynamics can be restored primarily by correcting the oligemia. In the late stage, shock may persist despite normovolemia or hypervolemia. This is not always the result of prolonged oligemia and hypotension, and other causes must be ruled out. Therapy in the late stages of shock includes maintenance of adequate circulating blood volume, monitored by measurements of central venous pressure. The use of vasocontrictors is contraindicated except under special circumstances. Evidence is accumulating in favor of the case of autonomic blocking agents. Adrenal cortical steroids in high doses may be useful. The basic abnormality which makes late shock intractable is not understood, and the mortality remains high.

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Community Mental Health Program

IRA V. HISCOCK, M.P.H., SC.D.
New Haven

Historical Note

In this year of expectation and of conflicts all around us, many organizations are at the crossroads of the Pathways to Prevention of Mental Disorder and Promotion of Mental Health. Exploration and planning for new dimensions may reveal opportunities.

The pioneer voluntary association for "Mental Hygiene" was established in New Haven on May 6, 1908. The Connecticut Association was organized in the home of the late Anson Phelps Stokes—now the Faculty Club of Yale University. Clifford Beers, author of The Mind That Found Itself, stood in front of the old fireplace there when the vote was passed for the establishment of an association for the development of an action program. The small group included the late Governor Wilbur Cross, Dr. Gustavus Eliot, Dr. Diefendorf, (psychiatrist), Mr. Tyler, and a few others, who had met to confer with Beers about the deplorable situation. Less than a year later, on February 19, 1909, the National Committee for Mental Hygiene was founded in New York City, stimulated by such leaders as Clifford Beers, William James, Adolph Meyer, and William A. Welch.

The Mission

Vital tasks have changed in 54 years, with new experience and knowledge, countless new organizations, growth of population by birth and immigration, with increased wealth, prestige, urbanization, and other developments in a complex society. Because people are so much involved, Alice in Wonderland might well exclaim again, "All very confusing, everything being alive!"

The tasks are many and varied, but not overwhelming. They relate to organization, to voluntary cooperation, to education, to depth and content of program, as well as to financing which touches more people, perhaps, than any of the other points mentioned.

The practitioners of medicine, the pastors of various religious groups, teachers, and members of families of persons who are emotionally disturbed and handicapped have the largest stakes, as being most often and deeply involved—whether they seek it or not. How well prepared are they? The official and voluntary organizations were developed to help in meeting the situations. Regarding the voluntary mental health associations, a national advisory council has stated that these organizations[1] should keep the public informed about problems and needs of the mentally ill, and assist in interpreting to the public the mental health services developed through governmental efforts.

"Through educational programs and the involvement of citizens in mental health activities, the mental health associations seek to reduce fear and stigma, and bring about greater acceptance of the mentally ill and of psychiatric practices and methods. Their work encourages the wider application of existing knowledge in the treatment and rehabilitation of the mentally ill and retarded. They help to mobilize community resources for mutual efforts with official agencies in the development of community mental health services. They also render directly some services for which no other agency has yet assumed responsibility."

Based partly on Annual Meeting address, New Haven Area Mental Health Association, Wednesday, June 27, 1962.

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[1] NAMH Reporter, National Association for Mental Health, Inc., May 1962, Vol. 11, No. 5. See also Social Class and Mental Illness, August H. Hollingshead and Frederich C. Redlich, John Willy and Sons, Inc., New York and London, 1958; and Communication Health, Health News, New York State Department of Health, Albany, May 1962.

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We are living in a period of such high tempo, experiencing events over which we have little control, that we do well to take stock of where we are and where we should be going. Old time liberals are said to be yearning for flaming action; some are uneasy about professors around the White House; many other Americans have an unadventurous mood, or dislike making decisions. Tax reform is discussed by the New Frontiersmen; special aid for distressed areas of the world, anti-trust actions and promotion of exports, by others—all designed to speed up economic growth. Efforts are proposed to do something about urgent and hideously complex problems of our super-cities. Consideration is suggested of ways to shift the vast relief program to productive purposes. Proposals are argued on ways to obtain increased effectiveness in providing quality health care, and to increase the nation's supply of professional health personnel. We are warned that we cannot afford everything that the big pressure groups are asking for—including some things that the country urgently needs.

Our mission is to swing into action with reduced flow of words and do some high priority planning for the improvement of conditions of mental disorder which deserve attention, if we are to have:

Communication with Interpretation,

Understanding with Knowledge,

Participation with Informed Citizens

in a manner to use our limited resources of funds, personnel and facilities to the best advantage for patients, families and communities. The situation is due more to our methods than to our information and interest.

Estimate Of The Situation

There are complex and cumbersome factors involved, perhaps, in an overdose of misguided features of a so-called "democratic process." For example, in the New Haven Area, some 50 local and state, official and voluntary organizations are involved more or less with efforts, (well meant, but badly splintered) toward meeting problems of mental disorders, in addition to persons who have the greatest stakes and responsibilities mentioned earlier. How often are the physicians and pastors represented on boards and committees in matters of study and planning? Are board meetings so arranged and conducted to attract busy physicians and pastors and industrialists? How many young people are recruited for professional preparation from the sections of our society who know the cultural, economic and other conditions at first hand which may have relationships to problems and multiproblems faced by those who are given technical consultation and other services? How many board and committee members are recruited from those cultural and geographical areas and given constructive timely assistance for growth as invaluable volunteers? How many organizations remember the purposes for their *being*—to assist people usually with ideas but needing help—rather than unwholesome competition, empire building, vested interests? We are concerned, not because we are just "Do-Gooders"; but because we do not live in a world all our own. We are interested in our neighbor and in our fellow man—not in mere existence.

There are additional questions for stock taking. Does the local voluntary association get together with the local health department, as a practical matter? In Connecticut, for example, there is a state law, Section 17-225 of the General Statutes, which reads in part, "Any full-time director of health may apply to the State Department of Mental Health for funds to assist in establishing or maintaining a psychiatric clinic for children." How far have we come in providing for *rehabilitation* services, workshops, homemaker services, hospital auxiliaries, and other *bridges* between hospitals and homes?

While appraising our situation, now as to affairs of People, we may analyze, for example, where we are in relation to some major elements of a community mental health program, locally and statewide, official, voluntary, as follows:[2]

1. Coordinated Services involved with the process of making an early diagnosis and providing early treatment for individual cases of mental disorder.

2. Complementary Services in the community for rehabilitating the discharged and the convalescent patient from the mental hospital.

3. Consultative Services rendered by properly prepared mental health personnel to professional staffs of other agencies such as health and welfare departments, schools, courts, churches, and so on.

4. Educational activities to communicate to other professional people and to the general public what has been learned from the clinical relationships of mental health personnel regarding the problems of human personality.

5. Systematically organized services for prevention, with specific efforts to deal with facts of community life to reduce the frequency with which personality disorders occur, including matters of causa-

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[2] Newton Bigelow, M.D. Commissioner, New Program for Community Mental Health Services, 1954, New York State Department of Mental Health, Albany, New York. See also Epidemiology of Mental Disorders, W.H.O. Tech. Rep. Ser. 1960, 85; and the Psychiatric Hospital as a Centre for Preventive Work in Mental Health, W.H.O. Tech. Rep. Ser. 1957, 134; Mental Health Problems of Automation, W.H.O. Tech. Rep. Ser. 1959, 183; and Some Problems of Prevention and Treatment, W.H.O. and Mental Health, 1949-1961, W.H.O. Chronicle, Vol. 16, No. 5—May 1962.

tion of trauma, infection, malnutrition, poisoning and psychological causation.

6. Well considered services for the advancement of research and special appraisal studies, including the role of the voluntary agencies as partners with governmental organizations.[3]

A basic step in citizen action is the measuring of resources and the revealing of needs. "There seems, however, to be no end to the needs that we can uncover. The trick is to reconcile our efforts to meet needs with our resources," says Dr. George S. Stevenson. We must choose those that are most pressing and promising.

We are aware, in Connecticut, of the strong program being developed by the State Department of Mental Health, of the important services of the Yale University School of Medicine Department of Psychiatry and the Yale Child Study Center, and of the Connecticut Association of Mental Health with its Committees on Legislation and on Self Study. The program for the mentally retarded[4] is bolstered by a lively voluntary organization, and by an official section in the Connecticut State Department of Health, which is gaining momentum. These are promising for Today and Tomorrow and 1970.

Other Factors

For community based mental health facilities, services and resources in a plan of action, we can do many things, such as those contained in the 1962 Self Study Proceedings of the Connecticut Association for Mental Health:

1. Determine the status of services and facilities.
2. Ascertain the unmet needs in our area.
3. Establish priorities based on most critical needs, timeliness of developing services, availability of resources of support and financing, relationship to existing facilities, agencies, services and people.
4. Plan a course of action which includes community education, systematic appraisal,[5] and participation with all related key groups, both official and voluntary.

Citizens need information and ideas to interest them and to influence their attitudes towards people in ways of living. Many of our dreams can come true by increased joint planning, better communication, better qualified staff, and improved co-operative action.

Summary

Clumsy methods and vested interests, ignorance and prejudice, confusing mazes of official and voluntary agencies, scarcity of prepared executives and imaginative leaders are barriers in the way of scientific advance. Concentration of effort in the next years should embrace the community, with wiser administration and research, stepped up instruction in professional schools, integration and interpretation of effort between all agencies in the health, welfare, and education structures. Immediate needs are to strengthen the hospital-home bridge while remembering the patient and "the purpose of being," plus a large dose of money to be used by those who can demonstrate effective utilization.

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[3] Proceedings of the Mental Health Assembly, 1961, Action for Mental Health, National Association for Mental Health, Miami Beach, Florida, Nov. 14-18, 1961; and Action for Mental Health, Digest of Final Report of Joint Commission on Mental Illness and Health, The Modern Hospital, March 1961, and full report, published by Basic Books Inc., 59 Fourth Avenue, New York 3, N. Y. $6.75.

[4] Proceedings of the London Conference on the Scientific Study of Mental Deficiency, July 24-26, 1960, Vols. I and 2, 1962, May and Baker Ltd., Dagenham, England, Price 45/-.

[5] Perhaps a success story from the State — Community Research Associates area study around Meriden and Middletown would bring public sympathy and support to the Medical and Social problems in Connecticut—the pioneer in voluntary mental health association activities.

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EDITORIALS

Modern Medical Dogmas: Low Fat Diet In Liver Disease

When the celebrated Benjamin Rush brought many of his patients to the brink of disaster by purging and bleeding them, he believed he was contributing to the saving of life. Today, it seems like a barbarous way of dealing with a patient already badly dehydrated by dysentery or cholera. It is intriguing to survey what the future physician, looking back upon our practices, will think of some of them. Are we carrying out similar dogmatic practices which in some instances may prevent recovery or hasten demise? In these columns from time to time the editor will attempt to remind our readers of past and present medical dogmas. It seems that no area is more subject to dogma and "clinical impression" than diet.

In the beginning of the century the various diet prescribed for hepatic disease were low in carbohydrate to prevent "intestinal fermentation." They were low in protein to conserve "the energy required for nitrogen metabolism". They were low in fat because "insufficient bile was present for fat absorption. Each one of these were beliefs based upon nothing more or less than rationalization. How many cases of cirrhosis of the liver died as a result of such inadequate diets is unknown. How many cases of hepatitis so treated that were delayed in their recovery is also not known. In 1914 carbohydrate was restored to the diet in liver disease after Opie and Alford[1] reported experiments that on a carbohydrate diet rats were much more resistant to chloroform intoxication than rats on a fat diet alone. Their conclusion that carbohydrates exercise a protective action and fat an injurious action in liver disease, was extrapolated to human liver disease and has bedevilled the physician until recently.

In 1924, protein should have been restored to the diets but was not after Moise and Smith[2] pointed out that Opie's diets were totally inadequate to support growing dogs and for prolonged nutritional maintenance. In their studies the use of 47 per cent fats resulted in normal growth maintenance and liver regeneration without scarring following induced injury. Despite such recognition of the importance of protein for tissue repair, high carbohydrate diet persisted and protein came to be employed gradually, but low fat continued as a dogma in the therapeutic choice of most physicians. Part of the dietary dogma was due to failure to recognize the importance of nutritional deficiency in liver disease.

In 1940 and again in 1948, Pateck and Post[3] from much available evidence concluded that a balance of food factors was essential for liver function. Fifty-four patients in all stages of cirrhosis were studied. Most had a poor dietary history and 60 per cent showed vitamin deficiencies. The diets their patients received contained 140 grams protein, 175 grams fat and 365 grams carbohydrate supplemented with vitamins and liver extract. Twenty completely recovered, twelve were arrested and showed partial improvement. This was an excellent response. Food was taken avidly by their patients, and the stools did not contain excessive fat. These facts were easily passed over, although the increased protein content of Pateks diet did gain wide acceptance. But the low fat dogma persisted. It was fed as Crews and Faloon point out[4] by several fallacies. None of them true but all of them used to rationalize the low fat dogma. One was that hepatic fat is derived from dietary fat—not true. Another was that hepatic injury can be produced by high fat diets, also false. A third that fat is poorly absorbed in liver disease, also untrue. A fourth was that dietary fat is poorly tolerated in liver disease. Here Crews and Faloon point out the mischief of clinical impression since the symptoms of indigestion are due to the disease and not the diet. The final fallacy that low fat diets have been proven therapeutically effective in liver disease is controverted by all recent work especially that by Hoagland *et al*[6] who showed that a liberal fat diet produced a more rapid return to normal function in hepatitis. These findings have been confirmed both clinically and by liver function tests by many authors.

The fact is that a liberal fat intake contributes high calories needed in hepatitis, fatty liver and cirrhosis; that certain essential fatty acids will be obtained in a liberal intake of fats, and that offering fats may theoretically reduce the need to synthesize fat from precursors derived from carbohydrate and protein. A liberal fat diet will supply fat soluble vitamins A, D, and K, greatly required by malnourished patients with liver disease. Finally, a liberal fat diet by making food palatable will be accepted more readily by the sick person and raise his morale. More important is the fact that no author has noted any ill effects from a high fat diet, but instead, has noted a shortening of convalescence and increased survival and evidence of healing in patients with cirrhosis, compared to the low fat regime. And yet, many cirrhotics are still treated by low fat diets. Verily dogmas die hard. As Oliver Wendell Holmes aptly stated "A catchword long enough repeated can defy analysis for 100 years."

L.H.N.

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Rehabilitation After Myocardial Infarction

Some people have silent attacks of coronary occlusion and keep on working. Some die suddenly. In both of these extremes the problem of rehabilitation does not arise. It does arise in the vast majority however, who are either hospitalized or treated at home and recover from the acute episode. The first question a physician is obliged to consider is whether the underlying pathologic process is stable or whether the lesion has not healed or perhaps even increased in size. In the latter case evidence of necrosis by fever, sedimentation rate, transaminase determination can be reliable clues as to whether the process has stabilized or not. To some extent lack of stability of the lesion is determined by its extent. The severity of a lesion can be inferred from the degree of impairment of myocardial efficiency. A patient that has developed heart failure, shock, cardiomegaly, tachycardia, serious arrythmia or pulmonary infarction or severe angina is one with a very large lesion which will take months to heal if it ever will, and the 20 per cent mortality rate within the first two months after an initial attack is usually among this group.

However, those who have made a good functional recovery from the acute myocardial infarction, enter their convalescence with a need for encouragement about their picture, a need for confidence in their functional recovery and a need for a routine of rehabilitation which will at some time educate them to their limitations and free them from uncertainty about what it is safe for them to do and not to do.

To some extent a patient's confidence in his future is determined by his physicians attitude. Until about 1930 a patient who had had a myocardial infarction was considered to be totally and permanently disabled. He and everyone about him including his physician were forever apprehensive and any physical activity gave all of them much concern. Today, we know that most patients that have recovered from a myocardial infarct are able to resume light work within two or three months following an attack and can gradually increase their effort until about half of them even resume their former occupations. With such experience all around one, it is not difficult for a physician to be optimistic with his patient. He can point to scores of patients who have not had a second attack years after the first and who live normal lives occasionally even performing heavy work.

One way to instill confidence in his patient is to know exactly what physical limitations to place on his patient during convalescence and thereby dispel uncertainty both in himself, the patient and his family. A method is needed to determine the rate at which a specific patient may safely be returned to self-care after myocardial infarction. A satisfactory method would help to avoid the pitfalls involved when a patient on his own initiative attempts unsafe levels of activity. Some physicians depend upon time elapsed to decide when the patient may return to ambulation and self-care, a rather inefficient method which most often imposes unnecessary delay in the rehabilitation process. Since the heart reveals its ability as well as its embarrassment through absence or presence of symptoms and signs, these remain the best reliable guide to his rehabilitation.

Cain et al[1] have studied 335 patients to provide information as to a method of convalescent management of patients with recent myocardial infarction. They arranged ten levels of increasing activity from self care in bed to active exercise in bed to level walking to walking on an incline to light work tolerance, to self care, and finally to stair climbing. On any one day twenty minutes is devoted to the activity level but towards the end up to an hour is required. Whether or not a patient is allowed to move to higher levels of activity depends on his signs and symptoms. If the patient felt ill, or pulse rate rose over 100, if chest pain or dyspnoea appeared or if an anoxic pattern appeared in the electrocardiogram after the activity, then the patient is not allowed to progress to the next step and has "failed" this test, otherwise he has "passed" on to the next level of activity.

This graded exercise technique has served several useful purposes. It has greatly improved the patients understanding of their capacity as well as their limitations, so that they followed more faithfully their activity prescription. They were neither too bold nor too timid. The doctor was able to individualize the treatment and rehabilitation after myocardial infarction, so that he was able to encourage the patient to active life as early as is consistent with safety. Since the return to work is essential for the patients morale, physical well being and economic status, his earliest return consistent with safety will make the patient happier and relieve him of boredom and frustration.

It is interesting that the authors found the electrocardiogram after exercise the most useful of all the tests. Apparently early signs of coronary artery insufficiency can best be relied upon to show up in the exercising electrocardiogram. If the ST segment was isoelectric before undertaking graded exercise, such patients gave better performance. If the ST segment was displaced one minute or more after exercise, the patient needed to be slowed in the rate of rehabilitation, while those whose ST segment displacement was slight after exercise were the least predictable as far as activity progress was concerned. These patients need much more study. It is interesting that none of the patients completed their rehabilitation before four weeks after the acute attack while others took much longer. What is especially significant is that Cain et al felt secure in beginning rehabilitation as early as the 18th day. Clearly we are entering a new era in which rehabilitation in some patients based upon physiologic principles has become an important part of the management of patients recovering from acute myocardial infarction.

L.H.N.

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The Cigarette Break

All Connecticut physicians should read the article which appeared in the January, 1963, issue of CONNECTICUT MEDICINE titled "How Can We Change Attitudes and Action On Smoking?" by Dr. Ralph H. Boatman of Chapel Hill, N. C. Having read it, it behooves every one to take a long look at it and having done that, to act. This is a teenager problem and as such affects every family where children are growing up. It is becoming more than a family problem, it is a school problem. I am informed that in the Rockville (Conn.) High School, to discourage students from leaving the classrooms for the purpose of smoking a cigarette in the rest rooms, a "cigarette break" has been made the order of the day.

Dr. Boatman points out that smoking is high among those who have fallen behind their age equals in school, do not participate in extracurricular activities, and are taking scholastically less demanding school work. It is becoming almost a cliché to say that cigarette smoking is associated with an increased chance of developing lung cancer.

Apparently then it is a matter of educating our young people before they begin to smoke, i.e., before they are 16 or 17. What has happened to our Parent Teachers Associations that such a situation as a "cigarette break" during school hours is a rule of the day?

Roswell Park Memorial Institute in Buffalo, N. Y. recently removed all cigarette vending machines from its premises and at each machine location posted this sign: "Roswell Park Memorial Institute is dedicated to the detection, treatment, and prevention of cancer." In addition, the Institute has undertaken a pilot project in the Buffalo area schools to inform young people of the hazards of cigarette smoking.

Connecticut leads in many areas of health education and disease prevention. Here is one area where our educators need our support in supplying our young people with the facts, and where public opinion needs to be aroused, otherwise the "cigarette break" in public schools will become as common an institution as the "coffee break" is today in industry.

STANLEY B. WELD, M.D.

Are Periodic Health Examinations Worthwhile?

Periodic health examinations have been recommended for over a century, but our profession has made little effort to popularize them. In fact it is widely held that truly life threatening disease is usually discovered between examinations, that patients who are given a clean bill of health at an examination are lulled into a false sense of security and may ignore otherwise alarming early symptoms. Furthermore, it is held that the examiner's emphasis is upon disease and health and therefore, the examinations may encourage or produce hypochondriasis.

Baker[1] was asked the question whether men who have regular examinations live longer and enjoy better health than those who don't. His answer was "I think they do but have had very little experience with those who don't."

Three reasons are generally given to justify periodic health examinations; health education which includes reassurance. As regards health education, such examinations certainly offer an individual a chance to learn what is known about preventive medicine as it relates to himself. Every person is deluged with advice and misinformation from friends, magazines, newspapers and advertisements, so that he should be given an opportunity to learn what is truly applicable to his individual case.

The second reason for "health examination is the belief that more can be done to cure or arrest a disease if it is discovered before it causes symptoms or real illness. This is self-evident in some diseases such as obesity, diabetes, hypertension, glaucoma and rectal polyps before they turn malignant. At the same time let it be admitted that we are powerless to influence the course of other diseases even when found in the earliest recognizable stage. But this is not really an argument against the value of the method, because it will help to stimulate us to search for even earlier stages when perhaps reversal would be possible.

The third reason for health examination is reassurance. Without doubt, a real service can be rendered when a doctor after a careful examination can assure a patient that his symptoms are not caused by a feared disease but by a disorder of function that is correctable.

To what extent are these aims realized by those who have extensively engaged in periodic health examinations. Wade *et al*[2] studies on a group of 765 male employees examined over a period of ten or more years revealed that about on-third of significant disease occurring during a seven year period had been recognized at the time of periodic examinations. Because of the availability of medical clinics for these individuals, early symptoms of other diseases brought the employees back to the examining physician between examinations, thus facilitating early diagnosis in another third of the significant cases. The data presented by these authors regarding malignant disease is very disappointing, since five of six employees whose lesions were discovered at examination died within months after diagnosis. On the other hand, the authors believed that in patients suffering from degenerative cardiovascular disease, although they could not be cured, intelligent management undoubtedly contributed to their comfort and probably prolonged life. Aside from recognzing organic illnesses at the time of the examination, employees were encouraged to report promptly any new symptoms and signs and in this respect alone, periodic health examinations served a useful purpose.

Another extensive study of periodic health examinations has just been reported by Baker *et al.*[1] In twelve and one-half years they have done 18,000 examinations on about 7,500 people. However, they did not begin doing routine tests on ocular function until December of 1959. In fifteen months, 2,500 people had their ocular tension measured and 240 had borderline or elevated tension. None of these patients had eye symptoms. If such patients were to wait until glaucoma begins to cause symptoms, their vision would already be partially destroyed. Distant vision was found to deterioriate so gradually that a number of men couldn't recognize their friends across the street. And yet, these people were driving cars on the road!

The weakest link in the practice of preventive medicine and early diagnosis, was predicting myocardial infarction, since the authors failed about as often as they recognized that it was impending. However, this is probably more readily -accom plished now if one takes into account the factors of high risk such as obesity, hypertension, family history for genetic factors and excessive smoking and hypercholesterolemia.

14,500 proctoscopic examinations were done on 5,178 men and if they had polyps, their barium enema X-rays were also studied, 467 had ployps of the large bowel of which 40 were cancerous and removed.

Other diseases in which progress could be noted and reversed before they produce irreversible damage, were anemia, aneurysm, diabetes, hypertension and impending nervous breakdowns. The last is important because it behooves the examining physician to evaluate carefully his approach to the patient in reporting his findings and to emphasize positive constructive factors. Hypochondriasis which is found in all patient populations can be worsened by inept medical activity though it cannot be produced by examination. Hypochondriasis is a legitimate disorder requiring medical guidance and correction.

From these studies it is clear enough that the major objections which can be raised against periodic examinations are invalid. The yield of significant disease is not too low if the examination is comprehensive and includes occular tension measurements as well as proctoscopic examinations in addition to usual history physical examination, blood and urine analysis. Of course, practical considerations preclude doing all available diagnostic tests on every individual at frequent intervals to assure the earliest possible diagnosis of all potentially disabling diseases. On the other hand, total neglect except when symptoms appear is also unjustified. Certainly health education which includes disease prevention, together with early detection of disease and patient reassurance are goals within reach if one undertakes periodic health examinations which include among other observations, eye tension measurements, proctoscopic examinations, blood and urine examinations, and a careful history and physical examination.

L.H.N.

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Quantitative Morphology

Everything in medical science is moving in the direction of quantitation except morphology. Untold numbers of articles in recent years have been published on the energy and work of the heart, hardly any on its architecture. Nevertheless, the physiology of the heart can never be separated from its geometry and attempts to invade smaller and smaller units of the cell down to its molecules through electron microscopy and histo-chemistry will not in themselves be sufficient to help us to understand fully cardiac function and dysfunction unless we go back to cardiac geometry. It is no accident that originally physiology was called "living anatomy." We would do well to recapture that concept.

The classical methods for dissection that the pathologists are taught, in one way appear to be contrived to defeat an interest in cardiac geometry. At postmortem examination the pathologist incises and flattens the heart reducing it from a three dimensional structure to a two dimensional one. Its geometry is effectively destroyed. The description of the heart then is directed from valve to valve, from one chamber to another. Nevertheless, its surfaces are relevant to the function of the heart as a pump, because the essence of any pump is its surfaces. The disposition of the inner and outer layers of the myocardium running parallel, arising in the atrioventricular groove and inserting in the papillary muscles are vital to the understanding of valvular competence. The heart surfaces that face the shoulders and legs are important in understanding the electrocardiogram, nevertheless, no real information of a quantitative nature is available on these subjects. As a result, questions arising among physiologists and clinicians regarding heart function that relate to the structure of the heart cannot be answered by the pathologists, thereby leaving a serious informational and professional gap in cardiac research.

There are many reasons for this. In other branches of medicine quantitative methods usually involve simple arithmetical operations with integers. But morphology is a three dimensional problem and requires a more sophisticated and complicated mathematics. Nevertheless, it can be shown in certain of its aspects not to be too involved since the circulatory system can be reduced to a single surface.[1] The fact that the entire circulation can be reduced to the simplest of all forms, a single surface is a potentially interesting operation for progress often depends upon reducing an intrinsically complex problem to its simplest quantitative form.

Kant, the famous philosopher, pointed out in connection with chemistry that a discipline can be said to approach a science only insofar as it relates to mathematics. Cardiac morphology is the last to yield to mathematical methods but it is on the way. Linzbach,[2,4] *et al* and Schoenmakers[3] have used these tools to shed important light on such problems as cardiac hypertrophy, the mechanism of cardiac dilatation and many other problems that have reached an impasse on this side of the Atlantic. The new approach is called quantitative morphology which has already proven its usefulness in cardiovascular research and is also applicable to many other fields of investigation; The geometry of the pumonary alveolus in relation to pulmonary function in health and disease; The morphology of the cellular proliferation of cancer; The spatial relationship of cerebral ganglion cells. All these have been studied descriptively. Quantification will open new understanding in their respective fields.

It should be pointed out that quantitative morphology is only a new approach to cardiac function. It is not a new approach in science. D'Arcy Thompson in his book, *Growth and Form* published in 1914 already used simple mathematical tools to approach such age old questions as why leaves have their particular shapes, what governs the pattern of lines of the reindeer's horn, the symmetric convolutions of the seashells. Why are the legs of an insect so thread-like while those of the elephant are so much more massive relative to body weight? What physical properties are involved in the one-legged stance of the crane, and in the shape of a sea-gull?

Quantitative morphology must be expressed through the language of mathematics. It can be expected that the development of quantitative methods for studying cardiac anatomy and gross pathology will bring important new concepts and tools for unravelling basic problems of heart function in health and disease.

L.H.N.

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Promine And Retine—Constituents Of The Thymus Gland

As a result of a concentrated study of ten years duration, Dr. Szent-Györgi[1] and his collaborators have just announced that they have isolated from the thymus gland of calves two potent chemical substances, one a powerful promoter of growth which they call "promine" and the other an equally powerful inhibitor of growth, "retine."

The growth retarding substance has been found to be a potent inhibitor of a fast growing cancer in mice. Whether it is a substance specific for the thymus is unknown. What is known is that cancer inhibiting substances have been repeatedly described in various tissues. The authors speculate that retine may ultimately come to be used in cancer therapy. Calculated from observations on mice, the quantity needed to inhibit cancer in a full grown man seems inordinately high. However, the slower a cancer grows, the easier it is inhibited. Once retine is synthesized chemically more potent inhibitors will probably be devised and this opens a new field in chemotherapy in cancer. Retine or a more powerful derivative seems to have no other pharmacological action and this is one of the reasons why it and similarly promine have hitherto been overlooked.

Promine, the growth promoting substance, has been found to stimulate the growth of cancer, but is itself unable to produce cancer. There are indications suggesting that this one of the two substances found in the thymus has relation to the specific function of the gland which is most active when the animals are growing, when they are sexually immature and not yet able to produce progeny. Apparently, promine is similar in its action to the juvenile hormone known as the Peter Pan hormone found in certain insects and which keeps them in the juvenile state. However, the juvenile hormone which is found in the thymus of higher animals does not appear to be identical with promine but both appear to act as rejuvenating hormones restoring to the animal some of its youthful functions. If promine can keep animals sexually immature (it makes mice sterile), then when it is synthesized in large quantities and made available for clinical use it might even serve as an effective contraceptive, as well as a rejuvenating agent.

Somehow myasthenia gravis seem to be connected with the thymus since its extirpation often benefits such patients. Conversely the mirror image of myasthenia—myotonia—is aggravated by retine and benefitted by promine, observations obtained upon myotonic goats. Szent-Györgi's observations give some substance to the hope that retine may be used in cancer therapy while promine may find various medical applications. As for example, in myotonia, contraception and rejuvenation to mention but a few.

Why have these substances escaped recognition until now? Szent-Györgi points out that in a crude extract of the gland, both substances are present and compensate one another so that no activity is observed. Their chemical and physical properties are similar and separation is difficult. They show no cleancut water or fat solubility and tend to adhere to any substance or precipitate produced during the course of preparation. They have no drug action either. Before their properties could be known they first had to be separated. This is why it has taken ten years to finally clearly separate the two substances and delineate their biological activity.

The function of the thymus has remained a mystery for centuries. Lately, there has been a spurt in our knowledge. First, evidence has appeared pointing to the thymus as a master gland which produces mainly in infancy the immunity mechanism with which the body defends itself against invasion by foreign substances including the transplantation of organs from unrelated individuals. Such findings suggest the possibility that we may be entering a new era in which transplantation of whole organs may become possible. Then came evidence that leukemia begins in the thymus gland and that young mice without their thymus cannot be infected with the leukemia virus. Now promine having properties of a rejuvenating agent among other actions and retine which may turn out to be a potent anti-cancer agent. Truly we are in a biological revolution and advances are taking place at break-neck speed.

L.H.N.

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THE PRESIDENT'S PAGE

The wheels of the legislatures are again grinding out new laws from bills which are being introduced by our representatives. The current legislations are bound to influence our country and the practice of medicine. We are informed that Washington desires to pass a new medicare bill. The proposed bill brings us face to face with the fact that our Federal Legislators are embarked on a socialized medical program which is unethical and financially unsound. The government would by compulsion force an extra tax burden on persons who are already heavily taxed. This would demand the payment of health bills by poor citizens for those individuals who can afford to pay for their own health premiums. We can by personal communications, by the press, and by TV presentations, disclose the true underlying facts and continue to keep COMPAC alive and active.

We, in the State of Connecticut have three vital legislative issues: to implement the Kerr-Mills Bill; to enact a Good Samaritan bill; and to obtain an Animal Research Act.

The Kerr-Mills law is a venture; but it is fundamentally sound. The nine months in which it has been in operation in Connecticut would indicate that the bill might be implemented and made more useful if the restrictions for acceptance were removed and a greater flexibility be made towards applying major medicare. The bill is directed towards the medicare of the medically indigent. Why go part way in this proposition when we should recognize our responsibility and really complete the purpose for which it was devised?

The Good Samaritan bill has been long overdue. Doctors have been shunning opportunities to give first aid to persons injured on our highways because they were not protected from law suits especially when the injured person was treated while unconscious. Such situations should not be tolerated in the United States or in any other country. The freedom of the medical profession to give first aid to the acutely injured is truly one of the main responsibilities of the medical profession. The Council of the Connecticut State Medical Society has requested its legislative committee to present at the General Assembly, a bill which will permit physicians the freedom to give first aid to those injured on our highways. This freedom of service known as the Good Samaritan Act would return to the medical profession one of its most treasured opportunities and responsibilities.

The Animal Research Act is being developed and presented to the Connecticut General Assembly and the Federal Government in Washington. For several years medical schools, medical research institutions, and drug houses have been deficient in animals for experimentation. Individuals opposed to the use of animals for experimentation have exerted influence on our legislators to prevent the use of thousands of animals in our animal pounds which are not wanted and which are needlessly sacrificed.

It is proposed that permission for the use of these animals by the NARC and the Connecticut ARC be obtained through the Animal Act of 1962. Such an authorization should be granted jointly by the Public Health Department, the Secretary of Agriculture, and the National Council of Laboratory Animal Care. Animals under such a regime are given as good care as they would receive in an individual's home. They shall have clean and sanitary quarters, good food, and kind treatment by well trained attendants.

The three issues alluded to are current, and invite the serious interest of every physician and are definitely essential to the progress of medicine.

Clyde L. Deming, m.d.

FROM THE GENERAL MANAGER'S OFFICE

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COUNCIL MINUTES

Wednesday, December 19, 1962

A meeting of the Council was called to order by the Chairman, Ralph L. Gilman, at 2:00 P.M. on Wednesday, December 19, 1962. Present in addition to the Chairman were: Drs. Deming, Pitock, Goldberg, Hess, M. Caplan, Cullen, Scully, Wilson, O'Connor, Bradley, Grendon, Grant, Davis, Murray, Jr., Chartier, Dean, Martin, Egan, Abbot, H. Caplan, Phillips, Hastings. Also present: Mrs. Lindquist, Dr. Richards. Absent were: Drs. Gardner, Cornwell, Hughes, Sundquist, Gevalt and Beardsley.

APPROVAL OF MINUTES. It was VOTED to approve, as printed, the minutes of the meeting of November 15, 1962.

* * *

The Chairman set aside the regular order of business to inform the members of the Council of the sudden death of Vincent A. Gorman, Bridgeport, Associate Council from the Fairfield County Medical Association and Alternate Delegate to the American Medical Association. Dr. Gorman died on December 17, 1962, apparently from acute coronary thrombosis.

After observing a period of standing silence in memory of Dr. Gorman, a Resolution was unanimously adopted as follows:

"A Resolution

VINCENT A. GORMAN, M.D.

WHEREAS: Dr. Vincent A. Gorman of Bridgeport, an Active Member of the Connecticut State Medical Society from 1950 through 1962, served the Society well on various of its committees and as an Alternate Delegate to the American Medical Association and,

WHEREAS: In the Council of the Connecticut State Medical Society, he served with distinction as a representative of the Fairfield County Medical Association, and

WHEREAS: On behalf of the Society, he gave willingly of his time and energies to the affairs of his profession in a manner which redounded to the credit of Medicine in Connecticut, therefore be it

RESOLVED: That the Connecticut State Medical Society, through its Council, express its deep sense of loss on the occasion of the untimely death of Dr. Vincent A. Gorman, December 17, 1962, and be it further

RESOLVED: That this Resolution be made a part of the minutes of the Council of the Connecticut State Medical Society, and that a copy thereof be sent to Dr. Gorman's family."

* * *

EXEMPTION FROM DUES—LIFE MEMBERSHIP.

a. It was VOTED to exempt Michael C. Messina, East Hartford, from payment of 1963 dues a/c physical disability.

b. It was VOTED to grant Life Membership to the following: Grace M. Santore, Waterbury; G. Gardner Russell, Hartford; Walter L. Hogan, Hartford; Edward W. Foster, Meriden; Lyle G. Ellis, Hartford.

c. It was VOTED to adopt the following motion: "IT IS MOVED: That Life Membership status be approved upon qualifying, and that CSMS dues for the year approved be either waived or remitted retroactively for the calendar year in which application was received."

COMMITTEE RESIGNATIONS AND APPOINTMENTS.

a. It was VOTED to accept the resignation of John C. Allen, Hartford, as Chairman of the Committee on Rehabilitation. Dr. Allen will remain a member of the Committee. It was further VOTED to appoint Thomas F. Hines, Wallingford, (a member of the Committee) to succeed Dr. Allen as Chairman and to complete the latter's unexpired term in this post.

b. It was VOTED to appoint Norton G. Chaucer, Hartford, to membership on the Committee on Public Health to replace Alfred L. Burgdorf, Hartford deceased.

GREATER NEW HAVEN CHAMBER OF COMMERCE. It was VOTED to approve payment of 1963 membership dues in the GNHCC in the amount of $60.00.

THE CORPORATE PRACTICE OF MEDICINE, ETC. The following actions were taken:

a. It was VOTED to submit the report on the corporate practice of medicine by hospitals and allied matters to the Legal Department of the American Medical Association for study and advice.
b. It was VOTED to adopt the motion: "IT IS MOVED: That a Special Committee of the Council be appointed to study all developments on the corporate practice of medicine, to collect information from all parts of the state (on the subject), and to report on these matters at each meeting of the Council."
c. A motion was adopted which declared the Council's intentions toward the corporate practice of medicine and its decision to act in this matter using "whatever means the Council may deem most effective", and to request the eight component county medical associations "to take prompt action to support the Council in this determination." Copies of the motion as adopted are to be sent to officers of the county associations and members of the Council.
d. Received as information was a communication from the Section on Radiology of CSMS that the Section assures the Council "of its complete support in any legislative or legal action" the Society may take concerning the corporate practice of medicine by hospitals and related matters.

COMMITTEE ON HEALTH CAREERS. Having received from Bernard F. Mann, Chairman, an outline of the format and purposes of a brochure prepared by the Committee on Health Careers, it was VOTED to approve the request of the Committee to spend up to $2500 for an initial printing and desired distribution of 10,000 brochures, and to recommend that the Committee *not* solicit financial support from outside sources for these purposes.

COMMITTEE ON AGING. Based on a report and recommendations submitted to the Council by the Committee on Aging, it was VOTED to adopt the following Resolution:

WHEREAS: That the Council of the Connecticut State Medical Society request the Commissioner of the Connecticut State Department of Health to consider and act upon the following recommendations:

1. That he establish standards of curricula for training "geriatric aides", in chronic disease hospitals.
2. That he approve, for the purpose of training "geriatric aides", those State-operated and voluntary non-profit chronic disease hospitals in Connecticut which demonstrate adequate facilities (staff, faculty, adequate clinical training material, etc.) to meet the established standards.
3. That he authorize approval as "certified geriatric aides" of persons who successfully complete approved courses of training in chronic disease hospitals.
4. That he include such "geriatric aides" as required personnel (along with licensed practical nurses, etc.) for chronic disease hospitals, as outlined in the Public Health Code, Regulation No. 200, Sections IIb and IIIc, and be it further

RESOLVED: That a copy of the Report of the Committee on Aging of the Connecticut State Medical Society on which this resolution is based accompany this resolution in its transmittal to the Commissioner of Health.

DIRECTIVES TO THE COUNCIL BY THE HOUSE OF DELEGATES—December 4, 1962.

a. It was VOTED that the Chairman, after consultation with the President, appoint a Committee of three members of the Council and such others as may seem desirable to conduct a study and prepare a report for the Council (in time for presentation to the Annual Meeting of the House of Delegates on 4/30/63) on the subject of Resolution No. 2 (adopted by the House, 12/4/62): "Increasing the Availability of Service Benefits Prepayment Plans". It was further VOTED that the Special Committee be authorized to spend not more than $2,000 of the general funds of the Society for the purpose of conducting its assigned study.
b. It was VOTED to refer Resolution No. 1 (adopted by the House, 12/4/62) : "Definition of Certain CSMS Policies on Doctor-Care and Its Financing." to the Special Committee to Formulate Third Party Policy for further clarification, refinement and definition of the policies contained therein, and to request the Committee to report on same to the Council.

CONNECTICUT MEDICAL SERVICE, INC.

a. Upon receiving notice from Mr. Joseph V. Cronin, Secretary of the CMS Board, that Frank L. Polito, Torrington, a physician member of the Board, had resigned his directorship as of 12/1/62, and that the Board requested a replacement to complete Dr. Polito's unexpired term (1962-64), it was VOTED to submit the name of Jachin B. Davis, New Haven, to the CMS Corporators for election to replace Dr. Polito on the CMS Board and to complete Dr. Polito's unexpired term as a CMS (physician) Director.
b. Relative to nominations to the CMS Medical Advisory Committee which are made jointly by the Liaison Committees on CMS and CSMS, it was VOTED to leave such nominations to the discretion and judgment of the members of the Council's Liaison Committee with CMS, Inc.

The General Manager was requested to obtain and distribute to members of the CSMS liaison component a roster of the present CMS Medical Advisory Committee, both as to type of practice and geographical location.

c. It was VOTED to defer, until the next meeting of the Council, action on the requested (by CMS) nomination of four physician CMS Directors for two year terms, such nominees to be elected to Board membership at the Annual Meeting of the CMS Corporators in February, 1963. The General Manager was directed to provide the president of each county medical association with a roster of the eight incumbent physician CMS Directors, designating the duration of their terms of office and their area of practice, and to place the requested nominations on the agenda for the next Council meeting.

COMMITTEE ON HOSPITALS. Since Leopold M. Trifari, Chairman of the Committee on Hospitals, was unable to attend this meeting of the Council to enlarge upon a Report prepared and presented by his Committee on "house staff remuneration and financing educational programs for the house staff in the hospitals of Connecticut", it was VOTED to table consideration of the Report at this meeting, and to invite Dr. Trifari to join the Council at its next meeting for the purpose of personally presenting and explaining the contents of the Report.

REPORT OF COMMITTEE ON STATE LEGISLATION. It was VOTED to accept, as a report, the printed minutes of a joint meeting of the Committees on State and National Legislation which was held on December 14, 1962. Special emphasis was placed on one recommendation of the Committees: i.e., that the Council not authorize legislative representatives of the Connecticut Health League to "speak" for the Society (a member of the CHL) on legislative matters coming before the 1963 General Assembly.

CHRISTMAS BONUSES. It was VOTED to authorize the granting of Christmas bonuses to the Society's employees, the General Manager being excluded at his request.

SOCIETY AUTOMOBILE. It was announced that the Committee on Building Management had purchased a 1963 Chevrolet station wagon for official use by employees, at a net cost of $2,493.00. The purchase was made out of the Annual Meeting surplus account.

ELECTION OF STUDENT MEMBERS. It was VOTED to elect five Student Members.

SUBCOMMITTEE TO STUDY AND REVISE THE BYLAWS. It was VOTED to accept the Report of the Subcommittee as follows:

a. As to the status of a "suspended member of the Society" (requested by the Council, 10/24/62) it is the opinion of the Subcommittee that "A suspended member has not been expelled and therefore is still a member; but that certain privileges have been suspended as defined in the Bylaws" (Article IV Membership; Sections 1 and 4).

b. The Subcommittee recommends that an amendment to the Bylaws be developed to define what "suspension" actually means and what privileges are suspended.

It was VOTED to direct that a suitable amendment be developed by the Sub-committee.

RESOLUTION FROM THE BRIDGEPORT MEDICAL SOCIETY. Through a series of indirect transmittals, a resolution on amending the Workmen's Compensation Act was presented to the Council. The resolution had emanated from the Bridgeport Medical Society, having been adopted at a meeting of that organization on October 2, 1962. It was VOTED to refer the resolution to the Committee on State Legislation for study and report to the Council.

HOSPITAL STAFF PROBLEMS. It was VOTED that if the Medical Staff of the Johnson Memorial Hospital in Stafford Springs should submit a written statement on certain administrative and professional difficulties it is presently faced with, such statement should be referred to the Committee on Hospitals for study and report to the Council.

DATE OF NEXT MEETING. The date for the next meeting was set for Thursday, January 24, 1963.

1963 MEETINGS

March 28—179th Annual Meeting, New Haven County Medical Association. Business Meeting is tentatively scheduled for 2:30 P.M. Place of meeting not decided yet.

April 30-May 1-2—171st Annual Meeting, Connecticut State Medical Society, Statler-Hilton Hotel, Hartford.

May 15—Third Symposium on Graduate and Postgraduate Medical Education in the Community Hospitals to be held at the Yale-New Haven Medical Center, 1:30-5:30 P.M. Sponsored by the Connecticut State Medical Society, Connecticut Hospital Association and Yale School of Medicine.

June 16-20 – American Medical Association, Annual Meeting to be held in Atlantic City.

September 27—38th Connecticut Clinical Congress to be held at the Yale-New Haven Medical Center.

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Clinical Medicine

Clinical Pathological Conference

Edited by
Irwin S. Eskwith, m.d.
Bridgeport

The following conference was presented, under the supervision of Dr. Arthur Ginzler at St. Vincent's Hospital, Bridgeport, on October 6, 1959.

Dr. A. Ginzler*

The case selected for today's presentation is not only unique in its clinical aspects, but is unusual in that the diagnosis was made from microscopic study alone, no gross specimen being available.

This 60 year old white female was first admitted in November 1958, with chief complaint of loss of appetite of about 2 weeks duration. She was known to have had polycythemia for 10 years, for which she had been treated for about 8 years at Presbyterian Hospital. Her RBC count had been kept between 6 and 8 million by means of phlebotomies and Daraprim. She was then not seen by her physician for a period of 4 months, and on a subsequent visit her RBC count was found to be 4 million and hemoglobin 10 grams. She had lost about 10 lbs. in weight, and complained of weakness and loss of appetite. On a recent trip to Europe, she suffered an episode of "duodenal bleeding." Review of systems was non-contributory aside from the above.

PHYSICAL EXAMINATION revealed heart findings within normal range; no murmurs or irregularities of rhythm were present. Lungs were clear to auscultation and percussion. There was a suggestion of an epigastric mass on palpation of the abdomen but this was not definite. There was an old appendectomy scar. The liver was palpated under the right costal margin, and the spleen was described as palpable and slightly enlarged. The remainder of the physical examination was non-contributory. Clinical impression: polycythemia vera; possible abdominal malignancy.

Radiologic examination of gastro-intestinal tract showed "hypertrophic gastritis." Barium enema showed no evidence of organic or intrinsic large bowel pathology. X-ray of chest showed old scarring in right upper lung field, considered to be residual of old inflammatory process. Left ventricle was noted to be hypertrophied; there were arteriosclerotic changes of the aorta. ECG showed left axis deviation; otherwise normal.

LABORATORY: Hemoglobin 10.2 grams, RBC 3.63 million, hematocrit 33, WBC 3,100 with 66 per cent polys, 34 per cent lymphs. Reticulocytes 0.3 per cent. MCV 92, MCH 28, MCHC 31, color index 0.95, saturation index 0.9, volume index 1.0; bleeding time 1′ 10″; coagulation time 3′ 20″. Blood chloride, glucose, uric acid, sodium, urea nitrogen, creatinine, potassium and serum bilirubin all within normal range. Random urinalysis negative. Alkaline phosphatase 3.3 Besse-Lowry units (normal 0.8 to 2.3).

Patient was placed on Probanthine and modified Sippy diet. She improved moderately, and was discharged on 11th day after admission.

Her second admission was 4 months later, because of extensive generalized neurodermatitis. Questioning elicited history of similar eruption in 1953, described as blistering dermatosis covering scalp, cheeks, arms and legs; these apparently broke and became scaly and puritic. There was a recurrence in 1957, and a remnant persisted until the present. Recently the lesions again broke out and were associated with marked pruritis. At this time patient also gave history of femoral vein thrombosis (or possibly embolus from varicose veins) in 1952, with operative removal of clot and ligation of vein. Chronic stasis ulcer of femoral area since then. Review of systems at this time revealed that her appetite was good. Family history revealed father died of leukemia. Physical examination revealed P.M.I. 2 cm. outside midclavicular line. There was a scaling and lichenoid dermatosis of arms, hands, chin and neck. No palpable masses or enlargement of organs was found on abdominal examination. Right upper and lower quadrant scars were present, the former from an earlier cholecystectomy. There were varicose veins of both legs. Blood count on this admission: hemoglobin

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* Formerly Pathologist, St. Vincent's Hospital.

13.5 grams, hematocrit 42, WBC 12,400 with 70 per cent polys and 30 per cent lymphs. She was treated with colloid baths and steroids, with excellent response, and discharged 10 days after admission.

Patient was admitted the third time 3½ months later because of progressively increasing size of abdomen during the preceding 3 months. Examination of heart unremarkable; chest clear to percussion, with some coarse breath sounds and crepitant rales heard in left lower lung posteriorly. The liver was definitely enlarged to palpation, extending approximately 3 fingerbreaths below the right costal margin, and was firm, and uneven. The spleen was not palpable.

ADMISSION LABORATORY EXAMS: RBCs 6.8 million, hemoglobin 14.5 grams, hematocrit 48, color index 0.8, MCH 21, MCV 71, MCHC 30, WBCs 9,100 with 75 per cent neutrophils and 25 per cent lymphs. Blood glucose 95, thymol tubidity 3, urea nitrogen 15, direct bilirubin 0.4, total bilirubin 0.8, serum transaminase 34 SGO units. Urinalysis essentially negative. On sixth hospital day, a blood smear was reported by hematologic consultant as suggestive of preleukemic state; six days after that a bone marrow was described as hypercellular, with erythropoiesis increased more than myelopoiesis or thrombopoiesis (consistent with polycythemia vera) and no changes diagnostic of leukemia. Repeat ECG was normal. G-I series showed no intrinsic pathology of esophagus, stomach or duodenum; there was an extrinsic deformity of the stomach, attributed to an enlarged liver. Barium enema examination was reported as entirely negative. Vim-Silverman needle biopsy of liver showed no architectural deformity; there was marked dilatation and engorgement of the central lobular veins.

Exploratory laparotomy was performed about 2 weeks after admission. No tumor was found. The liver was described as being markedly enlarged, firm and bosselated; the spleen as firm and enlarged about 4 times normal. No other abdominal pathology was found. Repeat bone marrow aspiration 4 days later was reported as hyperplastic marrow, to such a degree that it would be difficult to exclude chronic myelocytic leukemia. BSP test revealed 6 per cent retention at 30 minutes. Patient was treated conservatively with increased protein and semi-fluid diet and diuretics. A week after laparotomy, paracentesis yielded over 4 liters of sanguinous fluid. A consultant described the liver as extending down 5 fingerbreadths below the right costal margin and across the entire abdomen and the spleen palpable 3 fingerbreadths below the left costal margin. He also elicited the following complaints not previously mentioned: 1) headaches relieved by phlebotomy; 2) "chronic ear difficulty"; 3) epigastric distress relieved by milk and antacids. He also noted a grade I aortic systolic murmur. Postoperatively patient received Dicumarol therapy and Methischol, and was discharged home on 12th p.o. day in fair condition.

Patient was readmitted for the 4th time 4 days later with rapidly increasing swelling of abdomen, weakness and "severe distress." Heart rate was irregular. Liver was still markedly enlarged; abdomen distended. No edema of extremities. ECG showed rate of 102, frequent auricular premature contractions and left axis deviation. X-ray of chest showed prominence of vascular markings; no evidence of consolidation, atelectasis or pleural effusion. Left diaphragm was noted in higher position than the right. Cardiac catheterization was done; attempt to explore the hepatic veins was not successful. Fibrinolysin drip and Dicumarol therapy were instituted. Cardiac consultant felt that patient's cardiac status was satisfactory, and that the premature auricular systoles were secondary to the abdominal condition. He also described the liver edge at 3 fingerbreadths below the right costal margin, and somewhat nodular. Spleen was not palpated.

LABORATORY DATA: Hemoglobin 16.5 grams, hematocrit 60, WBCs 11,000 with 87 per cent polys, 4 per cent eosinophils, 3 per cent basophils, 3 per cent mononuclear cells, 3 per cent lymphocytes. Blood chemistries normal. Urine albumin 1 plus; 15-20 wbc/hpf. Patient's condition did not improve. Paracentesis yielded only small amount of fluid. Patient discharged in fair condition 11 days after admission.

Patient's course at home subsequent to this last discharge was progressively downhill, with evidence of re-accumulation of ascites, coma, convulsions. She expired about a month later.

Discussion

***Dr. Edward Neth*†**

Although this patient's peripheal smear on the initial admission was not diagnostic of polycythemia vera, it seems reasonable to assume that the patient had had this disease. This is based upon the extensive studies she had received over a ten year period at several excellent centers besides our own. Her initial admission in November, 1958, was due to rather non-specific complaints centering about the g.i. tract. The most important physical findings were the moderate hepatomegaly and splenomegaly. At that time a chest film revealed slight cardiac enlargement and a G.I. series was interpreted to show only hypertrophic gastritis. The blood count, aside from the moderate luekopenia, was unremarkable. She did well until four months later when she was readmitted for a skin condition which responded initially to therapy and she was discharged ten days later. It was learned on this admission that she had suffered a thrombotic episode in a lower extremity in 1952. Thrombotic accidents, of course, are not unusual in the course of Osler-Vaquez' disease.

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† Assistant attending physician, St. Vincent's Hospital.

Three and one-half months later re-admission was necessary because of steadily increasing abdominal girth. At this time the liver was greatly enlarged although no splenomegaly was noted. The peripheral red cell count was slightly elevated at 6.8 million. The first bone marrow smear was reported by the hematologist as suggestive of a preleukemia state, and the second as showing increased erythropoiesis, consistent with polycythemia vera. These two interpretations are not necessarily contradictory. Most hematologists believe that the myeloproliferative disorders are related conditions caused by an unknown factor which produces a primary disorder of the marrow cell. In polycythemia vera one often sees the transition to myeloid metaplasia, myelofibrosis, and acute and chronic leukemia and leukemoid state of polycythemia vera. A subsequent bone marrow was reported as quite hyperplastic. The hematologist could not exclude chronic myelocytic leukemia. It is, of course, difficult to be certain whether this represented a transition to the leukemoid stage or true leukemia.

Two weeks after admission a laparotomy was performed. The surgeon found no evidence of tumor but discovered marked hepatomegaly and splenic enlargement. Unfortunately, no mention is made of ascites at this time and one must assume it was not present. However, one week later she developed abdominal fluid to such a degree that paracentesis yielded over four liters of sero-sanguinous fluid.

Some of the common causes of ascites are nephrosis, congestive heart failure, mediastinal lesions, constrictive pericarditis and tuberculous pericarditis. In addition, various tumors may result in this condition. There is little evidence in the protocol to support these causes of ascites which are not directly related to interference with the hepatic venous system. However, hepatic vein obstruction may result in the rapid appearance of ascites.

In a woman with a history of polycythemia vera, thrombosis of the hepatic vein, the so-called Budd-Chiari syndrome, must be suspected. This received considerable support from the needle biopsy of the liver performed at this time which revealed marked dilatation and engorgement of the central lobular veins with preservation of hepatic architecture. What is puzzling is the low B.S.P. retention of only 6 per cent. Usually this is quite elevated in this condition as is the alkaline phosphatase, both indicating cellular degeneration. The bilirubin is usually normal in hepatic vein obstruction.

The clinical picture of the Budd-Chiari syndrome varies depending upon rapidity of onset, extent of thrombosis, degree of recanalization and the extent of the collaterals. In acute cases there is right upper quadrant and back pain, and a tender liver. Shock and a rapidly fatal course have been reported. In more chronic cases, the liver and spleen enlarge markedly. In both instances signs and symptoms of portal hypertension develop, with ascites generally refractory to treatment. Usually, the liver is not nodular, but nodular livers have been reported. Venography is often an aid in diagnosis as are hepatic wedge pressures. Anticoagulants have been of no value in this condition. They are poorly tolerated by and dangerous to these patients.

Four days after her discharge, she was readmitted for the fourth time because of marked increase in ascites, abdominal distress, and severe weakness. In fact, the latter, shortly before admission, was so marked that she was semi-comatose for a short time. No evidence of congestive failure was found on examination and consultation. Cardiac catheterization was performed during this time although the results were not given. The patient was hospitalized eleven days and then discharged.

Dr. Irwin Eskwith*

Cardiac Catheterization was performed in the hope of entering a hepatic vein for the purpose of instilling fibrinolysin through the catheter directly into the vein over a period of several days. That is, it was planned to leave the catheter in situ. Actually, the hepatic vein was entered for a very short distance. While we were positioning the patient for an angiogram the catheter became dislodged. Two and one-half hours of manipulation failed to replace it. However, over the next seven days the patient received 100,000 units of fibrinolysin intravenously daily through the courtesy of Dr. R. V. Chapple, of the Ortho Research Foundation. As the protocol indicates, the therapy was not successful. However, Dr. Chapple has informed me that two cases of rather acute Budd-Chiari syndrome have been treated successfully with fibrinolysin.

Following discharge, the patient developed several episodes of weakness and coma, and expired at home.

Dr. Edward Neth

To summarize this history I feel that the condition resulting in the patient's death was hepatic vein thrombosis due to polycythema vera. The basis for such a diagnosis rests on the history, the

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* Attending Cardiologist, St. Vincent's Hospital.

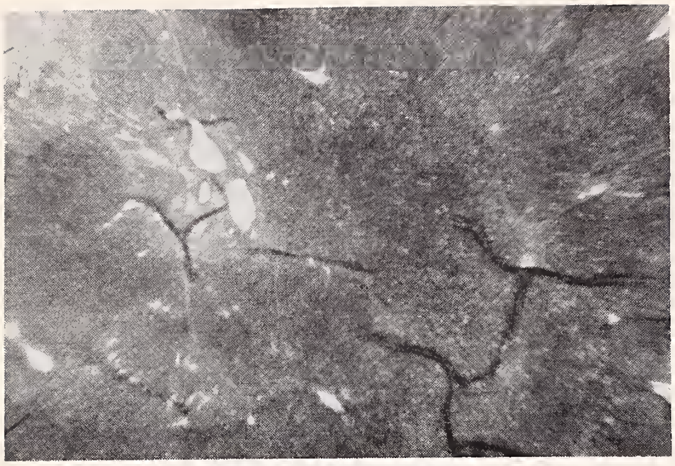

Figure I. Liver biopsy.

course of the patient and the needle biopsy of the liver.

Dr. Edward Montoni†

Unfortunately, no autopsy was obtained and the pathology department has based its diagnosis upon the needle biopsy. Before describing these slides I would like briefly to review some of the experimental findings concerning the cause and production of ascites. Madden in 1954 occluded the portal vein of dogs but failed to produce ascites. He did produce ascites when either the thoracic portion of the thoracic portion of the inferior vena cava, or the hepatic vein was occluded. He concluded that ascites resulted when there was a marked discrepancy between inflow of blood and egress from the liver. The ascites of Laennec's cirrhosis, with its marked architectural distortions, was viewed as being due to a marked reduction in the intrahepatic vascular bed.

Dr. David Frank

Another group of physicians have transplanted the dogs' livers into the pleural cavity after ligating the hepatic vein. This resulted in pleural effusion. From this it was concluded that ascites is due to weeping of lymphatics on the liver surface, caused by the increased hepatic intravascular pressure.

Dr. Montoni

Under the low power magnification the liver shows an unusually marked degree of dilatation of central veins. There are few viable cells remaining in the peri-central area and extensive interstitial hemorrhage is evident and coagulation necrosis of the enmeshed pericentral hepatic cells is present. In the hemorrhagic areas there is little evidence of hemosiderosis. The Mallory Tri-chrome strain (see illustration) confirms the presence of dilated central veins. There is moderate parenchymal fibrosis with a rather random distribution of the fibrotic strands. In summary these sections show post-necrotic cirrhosis, marked central vein dilatation, congestion, and massive interstitial hemorrhage and is compatible with the diagnosis of hepatic vein occlusion, probably transbodic, leading to the Budd-Chiari Syndrome. It is reasonable to assume that the probable hepatic vein thrombosis was a sequela of the polycythemia vera.

Clinical Diagnosis

Budd-Chiari Syndrome due to thrombosis of the hepatic vein, a result of polycythemia vera.

Pathological Diagnosis

Budd-Chiari Syndrome.

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† Formerly Chief Resident in Pathology, St. Vincent's Hospital.

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CONNECTICUT STATE MEDICAL SOCIETY

April 30, May 1, 2, 1963

Statler-Hilton Hotel, Hartford, Connecticut

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Special Article

1962—A Year Of Medical Development

The year 1962 was one of vast development in a wide field of medical sciences, a poll of the specialty sections of the American Medical Association revealed.

There may, in fact, have been several "breakthroughs"—but because of the growing complexity and intertwining of medical knowledge it could take some time to uncover these.

This was nowhere better exemplified than in the field of genetics where, in the footsteps of Drs. F. H. C. Crick, M. H. F. Wilkins and J. D. Watson, this year's Nobel Prize winners in medicine, the long-heralded breakdown of the genetic code is firmly underway. Breaking the code could be a gigantic step into the future for medicine, but first more knowledge will have to be developed.

The code, intertwined in a thread-like molecule of deoxyribonucleic acid (DNA), dictates all growth and life functions from the nucleus of every living cell.

It is reasoned that if this molecule is out of kilter it may create a chemical imbalance in the body, leading to defects or weaknesses. If an individual's code could be studied, then discovery of such imbalances might be possible and corrections made, perhaps by drugs or perhaps by juggling the code itself.

But knowing the code is not enough. There must also be an understanding of other complex unknowns of body chemistry and such understanding will probably require more years of research.

Advances in genetics, however, were not only in the field of deciphering DNA's code. Dr. Robert Gutherie of the University of Buffalo devised a blood test to determine at birth whether an infant suffers from phenylketonuria (PKU). This disease, caused by a chemical imbalance, prevents the body from breaking down certain food acids, which can cause irreparable brain damage. If this is known early enough, damage can be averted by control of the diet.

Another development which may lead to a general breakthrough in medicine was the discovery for the first time of a drug capable of curing a virus disease. Until now such diseases could only be prevented by vaccines.

At the AMA annual meeting in Chicago, Dr. Herbert E. Kaufman of the University of Florida offered proof that application of the drug 5-iododeoxyuridine kills off the herpes simplex virus which invades the cornea of the eye and may cause blindness.

Viruses work their destruction within living cells. Until now the only way to eliminate such viruses was to destroy the cells, causing as much harm as the virus. But Dr. Kaufman's findings offer hope that other virus cures will be found.

Another developing field in 1962 was that of medical transplants—replacing worn and diseased human parts with those of another person. The stumbling block to such operations has always been the body's usual refusal to accept the tissues of another person, unless that person is an identical twin.

Attempts to break down this reaction by heavy radiation or extremely strong drugs have been partially successful, but such methods often produce harm.

Proof in 1962 that the thymus gland is the seat of the body's defense mechanism, which rejects transplants, triggered hope that in the not too distant future manipulation of the gland and its secretions may make possible successful transplants.

While some success has been recognized in kidney transplants, the only consistent success has been with cornea transplants, which has practically no blood supply and so has no built-in immunity.

New techniques also spurred advances in other fields of surgery.

Specialists developed two methods of stimulating failing hearts. One process uses an electrical shock to make the heart continue beating. Another uses chemical stimulaters, implanted within the heart muscle.

There were also several methods devised to increase the flow of blood to the heart muscle. It was found that bits of spleen, which are rich in blood vessels, will take root when grafted to the muscle and thus increase the supply. Also pioneered was the diversion of a chest artery to the heart muscle.

Significant in the field of ear surgery was development of surgical means for replacing vital middle ear parts with plastic or stainless steel.

Hypothermia, cooling of the body, was given wider use by surgeons during the year, particularly when operating on vital organs such as the heart and brain.

Super cold, at nearly 400 degrees below freezing, became a medical tool during the year. Using a hollow, needle-like device at this temperature, Dr. Irving S. Cooper of New York City freezes a small area deep within the brain.

By this means he is able to stop the tremor and rigidity associated with Parkinson's disease, which afflicts about 300,000 in this country.

Another freezing technique, devised by Dr. Owen Wagensteen of the University of Minnesota, showed success in treating peptic ulcers. A balloon with tube attached is placed in the patient's stomach and inflated with a coolant.

Meanwhile, experiments with dogs may open the way to other surgical techniques aimed at curing cancerous organs, ulcers, and other ills. It was shown that stomachs, spleens, intestines and other organs could be taken out of dogs, given radical treatment even with radiation that otherwise would kill the dogs, and reimplanted.

As in preceding years, much of the effort in drug development was directed at cancer. No one drug proved completely successful, but several—notably thio-tepa, Methotrexate and 5-Flurouracil — may point the way toward possible breakthroughs in the field.

Some gains were noted with the use of super-toxic doses of drugs—doses which normally would be fatal. It was found that these could be used in certain sections of the body if these sections are "tied off" from the regular blood supply and kept alive with heart-lung machines.

Another drug—Ethionamide—showed its merit in fighting tuberculosis, especially in view of the increasing resistance by the tubercle bacilli, which causes the disease, to present medications.

Other developments included new type penicillins more efficient against drug-resistant bacteria and less likely to cause allergic reactions in patients.

There were also several pluses in the field of vaccines. The new measles vaccine was showing good results in field tests, although it is not yet on the market. Also, the way was possibly open for development of a German measles vaccine with isolation for the first time, of the rubella virus. This disease, if contracted by a mother in early pregnancy, may result in the birth of a defective child.

Also developed and being tested is a vaccine which promises success in malaria immunization.

The Sabin oral polio vaccine got its first wide-scale use, and by year's end had created somewhat of a storm. There were reports of a few cases of type III polio following inoculation with the Sabin type III vaccine. However, Dr. Albert Sabin said his studies showed no evidence that the cases were linked with his vaccine. At any rate, the incidence of polio appeared headed for an all-time low.

Public health in 1962 was less concerned with breakthroughs than with breakdowns. Smallpox created a scare and brought to light the fact that millions in America probably have no immunity to the disease. Taking note of the "dangerous low" in smallpox protection, the AMA urged physicians and their patients to help rebuild the nation's level of immunity to the disease. Venereal disease, supposed to be on the way out five years ago, was making a strong comeback, as was tetanus, an easily preventable disease.

No person will have occasion to complain of the want of time who never loses any.

—Thomas Jefferson

WOMAN'S AUXILIARY

President
Mrs. Norman H. Gardner, East Hampton

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Our president, Mrs. Norman Gardner, attended the Interim Session of the A.M.A. in Los Angeles in November. The highlights were an AMPAC dinner which was a complete sellout and an AMPAC breakfast to which each state president or her representative was invited. The successes and failures this year were discussed by party politicians and AMPAC officials.

The following points were stressed, the importance of political organizations, the need for securing sustaining membership in AMPAC as well as State PAC and the value of person to person contacts in getting memberships. Better than 70 per cent of AMPAC candidates won. All politically astute people agree that the potential of AMPAC is tremendous. New members must be added, memberships renewed so that the 63 dollars may be set aside for the 1964 war chest.

The Connecticut Society for Medical Research, Inc. has asked the members of the auxiliary to participate in the forthcoming legislation. They need help and have to prove to the legislators in Hartford that the Humane Research Act is a matter of importance to more people than just the handful of investigators who are doing "dog surgery." In political values this handful doesn't rate as much attention as the antivivisectionists because it is too dignified and not so vocal. We can prepare a resolution in favor of bill, present material and speakers, offer membership in CSMR to our group, appraise members through the media of the *Quarterly* and News Letters on a local level.

One out of every 10 medical student in the United States is benefiting from the new student loan program developed by AMAERF Loans have hit the $9 million mark with 4,829 aided, in 83 medical schools and 399 hospitals, showing that young people today want the chance to stand on their own two feet. Merck, Sharpe & Dohme, a Philadelphia pharmaceutical firm, has made its second grant of $100,000 as an investment in the future of the medical profession.

The Darien Book Aid Plan announces that the contributions during the past have permitted the distribution of more than 71½ tons of American literature. Word has been received confirming these gifts as beneficial and have fostered good will.

The State Health Careers' Committee announces that a newly revised 'Guidebook for High School Guidance Councillors' will be printed in the near future. A thirty minute dramatic film from A.M.A., dealing with the deceits and dangers of nutrition quacks and food fads is now available. It is programmed for high schools, church groups and community organizations. The purpose of Future Nurses Clubs is to bring together in high school young people interested in careers in nursing and health in order to share their interests, to explore opportunities and requirements in these fields, to grow as individuals by working together, and to learn about the community life in which they soon will participate as informed citizens.

The Fairfield County Auxiliary sponsored a tea and tour of St. Vincent's Hospital for prospective nurses and as always was well attended by students from high schools in the area. The annual collection of gifts and monies for Christmas has been made and will be delivered to Fairfield State Hospital and Laurel Heights Sanatarium. The auxiliary will assist in the legislative bill proposed by the Connecticut Society for Medical Research, Inc.

Fourteen members of the Litchfield auxiliary served as vision screeners at a glaucoma clinic sponsored by the Connecticut Society for the Prevention of Blindness held at the Charlotte Hungerford

Hospital in Torrington. There was a total of 943 persons screened.

Middlesex auxiliary has set their goal for AMAERF at $5 per member. The Health Careers program is having a tremendous response in the smaller towns with a new interest in physical therapy. Christmas gifts for the Connecticut Valley Hospital have been distributed. Luncheons have been given for the patients. There has been excellent publicity.

Dr. Max Caplan spoke at an evening meeting on the subject of Quackery that is being practiced in this country. During the course of the business meeting, it was unanimously voted to give $100 to the AMASRF student loan fund.

Several members of the New London Auxiliary assisted at the second oral polio clinic sponsored by the New London Health Department. A new series of coffee hours twice a month are being given at the Norwich State Hospital. A benefit dinner dance will be given for AMAERF and their Scholarship fund.

The membership in the Auxiliary to the Connecticut State Medical Society now stands at 1,177.

Community Service

"Service is the rent we pay for the space we occupy in the *Community,"* and that "Every Auxiliary member has something to give her *Community."*

S—*Skills,* a talent or an interest to share or teach.

E—*Educational* companionship to give to the lonely of all ages, whether they be other auxiliary members, the aged, the mentally ill or the handicapped.

R—*Recreational* equipment which children have outgrown, to donate . . . . such as a ping pong table for a children's home, a piano no longer used for the oldsters, books, or records for the patients in a state mental institution.

V—*Vision* and vital imagination to originate and and develop needed projects suggested by medical advisors for *Youth Fitness* and other health programs.

I—*Insight* into the problems of others, and a willingness to serve on committees or with other groups (church, school and social) working to meet community and world needs.

C—a *Car* to drive the sick, or handicapped to the hospital, clinics, brace shops, or on a pleasure outing.

E—*Even* a little money, to purchase some note paper, for a shut-in, or supply cards, Kleenex, flower seeds or soap, for a forgotten patient in an institution, or even a little courage to do what needs to be done at the time it should be done to combat *Medical Quackery.*

HOMEMAKER SERVICE. Auxiliaries and individual members organize and sponsor this service which helps aged people to stay in their own homes and keeps families together when illness strikes. Members have written and published "How To Plan a Community Homemaker Service," widely used by governmental and voluntary agencies across the nation.

SAFE BABY SITTERS have been trained by members through the GEMS (Good Emergency Mother Substitute) program since 1952. Thousands have been properly trained to prevent needless accidents and deaths when the mother is away. A televised GEMS program won a National Safety Council award in 1962. Awards also went to auxiliaries for poison control and water safety programs.

HEALTH EDUCATION includes distribution of free subscriptions to TODAY'S HEALTH, the American Medical Association-sponsored health magazine, to 13,000 schools. The auxiliary has backed the AMA's health education program since 1923 when it first promoted HYGEIA (forerunner of TODAY'S HEALTH.) Members also provide health information to schools and women's groups through pamphlets, films, exhibits and qualified speakers.

LEGISLATION which would protect the health of the people is supported, that which would lower standards of medical care is vigorously opposed.

VOLUNTARY HEALTH AGENCIES utilize efforts of members as leaders, fund raisers and health educators.

INTERNATIONAL HEALTH. The world is the community which benefits from organized efforts of the auxiliary to collect and ship bandages, drugs, medical text books and used equipment and instruments to countries in need.

American Medical Writers' Association

American Medical Writers' Association, now 20 years old, is a national professional society of people who are engaged or interested in medical communications. It stages an annual two-day convention (Chicago in '63; Philadelphia in '64); provides a medical manuscript editing service and a national placement service for members; grants awards and certificates for outstanding accomplishments in medical writing and editing; judges medical writing contests, maintains a roster of lecturers on medical writing, and offers scholarships for people contemplating a career in this field.

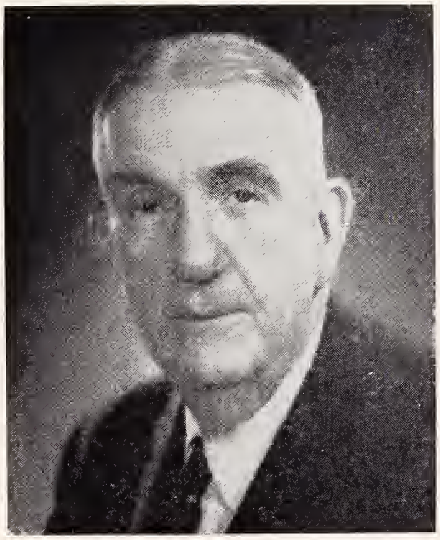
OBITUARY

Walter Irving Russell

1886 - 1962

Dr. Walter Irving Russell died at the Grace-New Haven Community Hospital on November 24, 1962 of carcinoma at the age of 76.

With the currently increasing complexity of the practice of medicine, for one man to have actively engaged in general practice for a span of over fifty years is an achievement of no little note. For a man to have done so in a community as sophisticated medically as New Haven is even more noteworthy.



Dr. Russell was born on his family's farm in Mystic, Connecticut, on March 11, 1886, the son of the late John and Mary French Russell. He attended grade school in Mystic, and was graduated from high school in New London. He then entered the Yale Medical School from which he was graduated in 1909. He served a two year internship at the New Haven Hospital and had a brief period of training in obstetrics at the New York Lying-In Hospital. He entered general practice in New Haven in 1911 and continued a very active practice, without interruption, until his final illness incapacitated him. Even during his terminal illness, between a few hospitalizations, he faithfully attended his patients in his office, in the hospital, and on house calls. It was only when pain became unendurable that he was compelled to stop seeing patients. He bore his terminal illness with great patience and stoicism.

Dr. Russell held the highest appointive and elective positions in local and state medical organizations. He served for twenty years as attending physician at Grace Hospital and since 1953 was consultant in medicine at the Grace-New Haven Community Hospital. In his time, he served as president of the New Haven City Medical Association, the New Haven County Medical Association and the Connecticut State Medical Society. Before his election as president of the Connecticut State Medical Society, he served as alternate councilor and later as councilor. He was a member of the Professional Policy Planning Committee of the Connecticut Medical Service and also served on C. M. S. Board of Directors. He was a member of the American Medical Association. He was also a member of the Medical Advisory Board of the Woodruff Rehabilitation Center in New Haven, and the courtesy staff of the Hospital of St. Raphael.

He was truly a beloved physician. His medical career begun when general practice was the normal pursuit of a doctor. In more recent years, the proliferation of specialties and sub-specialties made him stand out as an exemplar of the doctor of the old school. In a period when doctors direct their attention to tracts of organs or single organs. Dr. Russell continued to treat patients as complete persons. He attended generations of families. He treated patients of all ages, from infancy through old age. On his death, scores of families were bereft of their doctor, their friend and their counsellor, who stood at their side with expert consultants when special skills were called for.

At no time did Dr. Russell withdraw from the scene of trouble. It has been said that God must love the poor, for he has made so many of them. Dr. Russell was on God's side, for he spent countless hours with the poor, guiding them and helping them with their illnesses and problems. He had the uncommon gift of being able to communicate with people of all ages, creeds, walks of life and all levels of social position. All who knew him found in him warmth and understanding. Truly he was a doctor of rare sympathy and wisdom.

With Dr. Russell's passing, his family, the medical profession and the community have suffered an irreplaceable loss of one of the vanishing breed of genuinely devoted family doctors. In him were exemplified the Hippocratic standards of Learning, Sagacity, Humanity and Probity.

Harry G. Moss, M.D.

In Memoriam

Fern, Burton H. —Stratford; New York University School of Medicine, 1948. Dr. Fern served in the medical corps of the Air Force during the Korean conflict and opened his practice as a pediatrician in Stratford in 1953. Dr. Fern was polio-stricken in 1955, but overcame his handicap to become a national syndicated columnist. During 1960 Dr. Fern accepted an offer from the King Newspaper Features syndicate to write a daily health column, which appeared in daily newspapers all over the country. Dr. Fern was on the staff at Bridgeport Hospital and served as a consultant and lecturer on pediatrics. He was engaged in research projects sponsored by Yale University in New Haven Hospital. Through the past several years, articles by Dr. Fern have appeared in a number of periodicals with national circulation. In 1957, Dr. Fern appeared in a motion picture produced by the National Foundation for Infantile Paralysis for the 1958 March of Dimes. The film entitled "Survival is Not Enough," was a documentary of the possibilities of rehabilitation of post-polio patients. Dr. Fern was awarded the Man of the Year citation in 1960 by the Raymond T. Goldbach post, VFW in Stratford. He also received the Distinguished Services award from the Stratford Junior Chamber of Commerce, and the 1960 award from the Connecticut Junior Chamber of Commerce. Dr. Fern was a member of the Fairfield County Medical Association and the Connecticut State Medical Society. Dr. Fern died January 1, at the age of 37.

Friedberg, Sol—Stamford; Long Island University, 1928. Dr. Friedberg had been practicing medicine for 32 years. He was a member of the A.M.A. and the Connecticut State Medical Society. A past president of the Stamford Medical Society and an attending physician at Stamford and St. Joseph's Hospitals, Dr. Friedberg was a member of the Temple Beth El, the Jewish Center and the Rockrimmon Country Club. Dr. Friedberg died December 22, at the age of 59.

Gorman, Vincent A.—Bridgeport; Cornell University Medical College, 1942. Dr. Gorman had practiced general surgery in the Bridgeport area for 12 years. He served three years as a combat surgeon to the amphibious corps of the U. S. Navy in the South and Central Pacific areas during World War II. He left the service in 1946 with the rank of lieutenant. Dr. Gorman was an attending surgeon at St. Vincent's Hospital and prior to this time was associate attending surgeon. Until his death, Dr. Gorman was chairman of the hospital's medical records committee, and a member of the education advisory, tissue, and staff program committees. Dr. Gorman had served as consulting surgeon in Englewood hospital until it closed in January, 1961. He was a member of the courtesy staff of Bridgeport and Milford hospitals. Dr. Gorman was a diplomate of the American Board of Surgeons and a member of the Connecticut Society for Board Surgeons. A member of the A.M.A., Connecticut State Medical Society, Fairfield County Medical Association and Bridgeport Medical Society. Dr. Gorman served as councilor from the Fairfield County Medical Association to the State Society, and was an alternate delegate from the State Society to the A.M.A. Dr. Gorman was a fellow of the American College of Gastro-Enterologists and past-president of the Southeastern Connecticut Notre Dame Alumni association. Dr. Gorman's memberships also included the alumni association of New York hospital, Trumbull Exchange Club, Bridgeport Elks and the K of C, of Kingston, New York. Dr. Gorman died December 17, at the age of 48.

Little, Herman C.—New Haven; Yale University School of Medicine, 1910. Dr. Little went to Changsha, China with Yale in 1911 and was there until 1913 during the Chinese revolution. Dr. Little practiced medicine in Stonington where he was medical examiner until moving to Willimantic in 1917. He was physician and surgeon at the American Thread Company and attending physician at St. Joseph's Hospital there until 1926. Dr. Little was assistant in ophthalmology at the New York Post Graduate Medical School and Hospital prior to coming to New Haven in 1928. He was associated with the Yale University School of Medicine and was assistant attending surgeon at New Haven Hospital and attending ophthalmologist at Grace-New Haven Hospital. Dr. Little was a member of the Medical Advisory Board of New Haven during World War II, the Connecticut State Medical Society, American Medical Association, the New Haven County and New Haven City Medical Associations and the Connecticut State Eye, Ear, Nose and Throat Society; the New Haven Ophthalmological Society and the Yale Medical Alumni Association. He was also a member of the New Haven Country Club, the Graduate Club Association of New Haven, the Yale Faculty Club, and deacon of

Edgewood Congregational Church and a member of the Society of Mayflower Descendents. Dr. Little died January 5, at the age of 78.

Nemoitin, Jacob—Stamford; College of Physicians and Surgeons of Columbia University, 1905. Practicing physician in Stamford for 55 years, Dr. Nemoitin made his calls by bicycle at first, progressing to horse and buggy and then to a Model T Ford. Dr. Nemoitin learned the Italian language and brushed up on his Russian and Polish so that he could better understand and treat the many immigrants. Dr. Nemoitin was on the honorary staff of the Stamford Hospital and on the consulting staff of St. Joseph's Hospital. He was a member of the Stamford Medical Society, Fairfield County Medical Association, the Connecticut State of Connecticut Medical Society and the American Medical Association. Dr. Nemoitin died January 3, at the age of 81.

Ryder, William H.—New Haven; Jefferson Medical College, 1920. Dr. Ryder was a practicing ophthalmologist here for 28 years, and former chief of ophthalmology at St. Raphael's Hospital. Dr. Ryder was a former president of the staff at the Hospital of St. Raphael and former chairman of the executive committee of the hospital. He was also a diplomate of the American Board of Opthalmology, a fellow of the American Association of Ophthalmology and Otolaryngology, a fellow of the American College of Surgeons and the International College of Surgeons, a member of the New England Ophthalmological Society, the New York Association of Medicine, former vice president of the Jefferson Medical College Alumni Association, former vice president of the American Medical Association, a member of the New Haven County Medical Association and the Connecticut State Medical Society, a member of the Pan-Pacific Surgical Association, former police surgeon for the City of New Haven, and a member of the Police Anchor Club. He was a Fourth Degree member of thb Knights of St. Patrick, the Yale Faculty Club, and the New Haven Country Club. Dr. Ryder died December 31, at the age of 68.

Smilgin, Victor E.—New London; George Washington University, 1935. Dr. Smilgin had been a general practitioner in the New London area for 23 years. He was president of the New London Medical Society and a member of the New London County Medical Society. Dr. Smilgin was a member of the Connecticut State Medical Society and the American Medical Association. Dr. Smilgin died December 17, at the age of 53.

Around The State

New Haven County

Dr. Aaron B. Lerner, a Yale University professor whose research has led to important breakthroughs in the phenomenon of skin pigmentation is one of ten American medical leaders named to receive Distinguished Achievement Awards for contributions which have directly influenced current medical practice and thought.

He is head of the department of dermatology at Yale. The awards are presented annually by the Editors of *Modern Medicine,* international medical journal.

Dr. Lerner was specifically cited for his research on skin pigmentation and isolation of particular hormones involved in the production of melanin, an agent responsible for skin coloration.

New Haven County Medical Association

The 179th semi-annual meeting of the New Haven County Medical Association was held on Thursday, October 18, 1962 at the Waverly Inn, Cheshire. The meeting was followed by a well attended dinner.

Among the more interesting topics covered were the following:

1. Recommendation by Dr. Franklin Foote, Health Commissioner, for Flu shots. Only one shot being necessary where they have been given before.
2. A progress report of the Committee for the Study of Hospital Needs in New Haven County.
3. Dr. Louis C. Backhus of Waterbury was elected to fill a vacancy in the Medical Advisory Committee of C.M.S.
4. Establishment of a committee to study a method of increasing the attendance to association meetings.

Connecticut Allergy Society

The Connecticut Allergy Society announces the following officers for the year 1962-1963.

President: Marvin Mogil, M.D., New Haven.

Vice-President: Eugene H. Walzer, M.D., Bridgeport.

Secretary-Treasurer: A. Arthur Fierberg, M.D., Hartford.

The address of the Secretary is 36 Woodlawn Street, Hartford, Connecticut.

Doctor's Office

Patrick Bierne, M.D., announces the opening of an office for the general practice of medicine at 34 Church Street, New Milford.

Lawrence M. Blum, M.D., announces the opening of an office for the practice of dermatology at 325 Reef Road, Fairfield.

Robert H. Jordan, M.D., announces the removal of his office from 1441 Chapel Street to 111 Park Street, New Haven.

Emil D. Karlovsky, M.D., announces the removal of his office from 129 Whitney Avenue to 111 Park Street, New Haven.

Travis Kasle, M.D., announces the opening of an office in association with Anselm Schurgast, M.D., for the practice of psychiatry at 130 East Main Street, Meriden.

S. Jack Landau, M.D., announces the removal of his offices from 315 Whitney Avenue to 111 Park Street, New Haven.

Bernard Lavergne, M.D., announces the opening of an office for the practice of psychiatry at 65 Main Street, Old Saybrook.

Dominick V. Sorge, M.D., announces the opening of an office for the general practice of medicine at 562 Boston Avenue, Bridgeport.

Ely C. Wagshul, M.D., announces the opening of an office for the practice of urology at 95 East Main Street, Meriden.

Special Notices

Symposium On Pediatric Surgery

March 18-20, 1963

A Symposium on Pediatric Surgery, sponsored by The Greater New York Chapter of the National Foundation, will be held at The New York Hospital—Cornell Medical Center, March 18-20. The program will cover some of the more commonly encountered problems of Pediatric Surgery. Participants will include pediatric surgeons and pediatricians from various centers in the United States and Canada.

Information may be obtained by writing to the:

Program Director, Dr. S. Frank Redo
525 East 68th Street
New York 21, New York.

HOW ABOUT YOUR CONDITION, DOCTOR?

Everyone knows that doctors, occupied with the care of others, very often ignore their own health and well-being.

Let's look at some facts contained in a 13-year study of the estates of members of the Hartford County Medical Association. First, the study showed that doctors between the ages of 41 and 50 die at a rate twice that of the general population; and that the death rate for doctors between 61 and 70 is half again as much as that shown in standard insurance mortality tables.

Think of the surviving family members. The survey found that of the 144 deceased doctors included in the study:

- *34% had left no will*
- *13% were in debt at the time of death*
- *31% left net estates of less than $10,000*
- *62% were survived by their wives and families.*

Is this what you'd prescribe for *your* family?

Our Trust Department can help you provide for your family's future financial security by coordinating all your family assets—life insurance, real estate, securities and savings—into a single, private arrangement that not only minimizes estate settlement expense and delay, but provides a permanent yet flexible plan—including the possibility of attractive tax savings. Call or write Mr. William Dickinson at the Trust Department of our Main Office, 36 Pearl Street in Hartford, and arrange for a confidential discussion. It could be one of the most important appointments you'll ever make.

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AND TRUST COMPANY

Bockus — Gastroenterology
Volume I — Just Published!

New (2nd) Edition! The first volume of this highly respected 3-volume work has been completely revised. The entire set of books will cover every known disease and condition of the gastrointestinal tract and associated organs. The author emphasizes a sound clinical approach to each problem, and carefully explains the causes and mechanisms responsible for each complaint. *Volume I* incorporates all important advances in therapy for diseases of the *esophagus and stomach*. New chapters are included on topics such as: *Oral Manifestations of Internal Disease; Tests Employed in the Study of Esophageal Function and Disease*. More than 150 pages are devoted to modern methods of diagnosis and management of peptic ulcer, with special emphasis on complications. A particularly significant new section shows endoscopic views of the esophagus and stomach, in magnificent color.

By HENRY L. BOCKUS, M.D., Emeritus Professor of Medicine, University of Pennsylvania Graduate School of Medicine. With Contributions by 31 Former and Present Associates of the University of Pennsylvania Schools of Medicine. Three Volumes totalling about 3000 pages, 7″x10″, about 600 illustrations, some in color. *Volume I, Esophagus and Stomach*, 958 pages, 298 illustrations, $25.00, *Just Published. Volume II, ready August, 1963. Volume III, ready January, 1964.* *New (2nd) Edition!*

Meares — Management of the Anxious Patient

New! Here is a clearly written guide giving you specific instructions on managing patients suffering from anxiety or from disorders that may be based on emotional conflict or stress. Dr. Meares describes and explains the steps he uses in therapy. In a personal, informal presentation, devoid of esoteric jargon, the author tells you from what sources anxiety may spring. He shows you how anxiety can often be resolved without digging into your patient's past for childhood or infantile conflicts. He tells you *how to conduct the interview—how to elicit evidence of conflict—how to conduct the physical examination—how to use suggestion, drugs, etc.—how to avoid common treatment errors.* Dr. Meares describes the symptoms of anxiety as they appear in each body system. He also shows you how to manage anxiety in obstetrics, pediatrics and surgery.

By AINSLIE MEARES, M.D., D.P.M., Author of *The Medical Interview, A System of Medical Hypnosis, The Door of Serenity, Shapes of Sanity, Marriage and Personality, Hypnography,* and *The Introvert*. About 496 pages, 6″x9¼″. About $9.00.
New—Just Ready!

Today's Best Treatments

1963 Current Therapy

Here are the surest, most effective treatments known to medical science today for every disease you are likely to encounter. New and important changes in treatment for hundreds of diseases are detailed—diseases you may well be called on to treat within the year. Each is written specifically for *1963 Current Therapy* by an authority who is using it today.

This volume represents an extensive revision. Nearly 70% of the articles are changed in a significant manner. Among the 197 rewritten and revised articles you'll find: *Newer penicillins in the treatment of meningitis*—Treatment of whooping cough in the young infant—*Control of antibiotic-resistant staphylococci*—Newer knowledge of oral iron therapy—*Latest information on treatment of hepatitis*—Newest advice on treatment of adrenal insufficiency—*Action of sterols (Vitamin D and related agents)*—Management of conditions causing enuresis—*Relationship of hyperparathyroidism to urinary calculi*—Milk-alkali (Burnett's) syndrome—*Steroid spray in nickel dermatitis* — Elevated shoulder syndrome as a cause of headache—*Enzymes in management of postphlebitic syndrome*—Treatment of coma with analeptic drugs.

By 306 EMINENT AUTHORITIES Selected by a Special Board of Consultants. Edited by HOWARD F. CONN, M.D. About 864 pages, 8″x10½″. About $13.00. *New—Just Ready!*

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☐ Send Volumes II and III when ready
☐ Meares' Management of the Anxious Patient, about $9.00

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NEW BOOKS IN REVIEW

A TEXTBOOK OF ENDOCRINOLOGY. Third Edition by Robert H. Williams, M.D. W. B. Saunders Company, Piladelphia, Pennsylvania, 1962, 1204 pp. $21.00.

Reviewed by: LOUIS H. NAHUM

This is the Third Edition, the first having been issued in 1950 and the second in 1955. It is dedicated to three renowned endocrinologists, Fuller Albright, Charles H. Best and Bernardo A. Houssay. The editor is himself renowned in the field of endocrinology being Professor of Medicine, University of Washington Medical School in Seattle and Chief of the endocrinology and metabolism division, University Hospital. Almost all the contributors have engaged in basic and clinical investigations and are recognized for their skill in the practical application of basic knowledge to clinical problems. Considering the diverse authorship, the editor has skillfully avoided much repetition except where it was necessary for emphasis.

It is essentially a new book, rewritten because of the tremendous progress in endocrinology and metabolism during recent years. We have learned that hormones influence every body cell and affect markedly metabolism of carbohydrates, fats, proteins, minerals and vitamins. Since all major diseases influence and in turn are influenced by endocrine function, it is clear enough why a knowledge of endocrinology and metabolism is important in every branch of medicine.

The book is divided into 22 chapters from general principles of the physiology of the endocrines by the editor, through individual hormones, influence of endocrine glands on growth and development, hormones and cancer, lipid metabolism and lipopathies, genetics and endocrinology and a final chapter on diagnosis and treatment of endocrinopathies containing also hormone preparations.

The reader will not find renal hormones such as erythropoietin, necessary in red cell production or renin an important regulator of the arterial pressure. Angiotensin II is mentioned as a renal product whereas in fact it is the 2nd stage of a change in renin. As renin enters the blood stream, it is converted to angiotensin I a decapeptide which is reduced to angiotensin II in octapeptide with powerful vasoconstrictor properties as well as a stimulator of aldosterone secretion.

The reader will also not find mention of such important hormones of the nervous system elaborated by certain neurones such as serotonin, acetyl-choline, and norepinephrine and their probable effects on cerebration and autonomic activity. In spite of these omissions the book is an authoritative treatment of the conventional aspects of endocrinology and metabolism and indispensable in both teaching and scientific medical practice.

As is usual with Saunders books the paper is excellent, the printing very good, the captions of paragraphs so clear as to facilitate intelligent reading.

DIAGNOSIS AND TREATMENT OF ACUTE RADIATION INJURY. International Documents Service, Columbia University Press, New York, 1961, 412 pp., many illustrations, index, 425 pp., $8.00.

Reviewed by: MARSHALL BRUCER

In October of 1960 the International Atomic Energy Agency, using the World Health Organization as a front, called a symposium of about thirty people to describe a few of the most notorious radiation accidents, to discuss bone marrow transplantation, and to describe some more or less related work. The proceedings were out of date before they finally got published. No panacea was announced at the meeting, but the early diagnostic impressions did begin to show a consistency.

The proceedings start with a description of four major radiation accidents and a review of the lessons learned in some others. Then there is a review of the "secondary" syndrome (the disease that follows successful preliminary treatment with marrow in animals and probably in man), and the therapeutic irradiation of the whole body for the purpose of encouraging tissue (renal) transplants particularly. There is considerable discussion of the technical problems of gathering, storing, and administering bone marrow. The difficulties of human foetal grafts are emphasized. After a discussion of some pertinent experimental therapy in animals, the symposium is summarized by J. F. Loutit of the Medical Research Council in England.

The summary finds prevention more impressive than therapeusis. Protective chemical agents are ". . . not suitable for routine application in man." There are no new diagnostic procedures. Blood study and BAIBA excretion are still considered useful guides. Bone marrow transplantation has been disappointing; "There is little doubt that under rare circumstances the availability of such material might be lifesaving. However, some might consider the premium for this insurance to be too high, . . ." Strict asepsis, such as is followed in the treatment of severe burns, seems to be far more impressive than any other single therapeutic measure. The radiation dose to produce an effect is pushed up once again. Now we are talking in the 1,000 rather than the 500 rad range.

There is the smell of censorship in the American and Russian presentations. Certainly the Oak Ridge document was—("censorship" is a hard word; "administrative harassment" is probably better). None of this can be documented on paper since such censorship is done only over the telephone. The English and French documents show none. The summary by Killmann (page 163) and the ten-page summary by Loutit are worth pursual by the practicing physician. Most of the articles are well-written and well-illustrated. The entire document is well-printed and bound. For an industrial specialist, a radiotherapist, or a student of nuclear accidents, the book is well worth seeing as a summary of the best current opinions, but this book is historical grist for the practicing physician.

ELECTRODIAGNOSIS AND ELECTROMYOGRAPHY, *Second Edition, Sidney Licht, M.D., Editor, Elizabeth Licht, Publisher, 360 Fountain Street, New Haven, Connecticut, 1961, $12.00.*

Reviewed by: OTTO GOLDKAMP

Dr. Licht would appear to have added not only volume to his second edition, but also quality. Several of the chapters dealing with electrodiagnosis have remained relatively unchanged compared to the first edition. However, two chapters by noted physiologists bring the latest concepts of neuromuscular function out of the laboratory to a clinical level with remarkable clarity. The description of electromyographic apparatus and electrical principles involved comes close to a short and excellent course in basic electronics which should be well accepted by today's medical student, and of profitable interest to his seniors.

For the physician directly involved in electromyography (EMG) the emphasis on the relationship of tissue changes and physiology to EMG records helps remove some empiricism. The addition of chapters on nerve conduction and clinical electromyography boost the book's value as a basic text. Electromyography is not yet at the stage of electrocardiography, or even of electroencephalography, but the organization of well documented information into a text is an important step in this direction, which this represents.

RESPIRATION IN HEALTH AND DISEASE *by R. M. Cherniack, M.D., and L. Cherniack, M.D. W. B. Saunders Company, Philadelphia, Pennsylvania, 1961, 403 pp. $10.50.*

Reviewed by: LOUIS H. NAHUM

For a clinician there is something refreshing about a book which concentrates neither on pulmonary physiology nor on purely descriptive aspects of respiratory disease but rather on the symptoms and abnormal signs which develop as a result of a particular althological pattern. The authors who are assistant professors of medicine at the Manitoba School of Medicine are uniquely fitted to achieve the synthesis between physiology and structure and have succeeded admirably in such a task. One, R. M. Cherniack has had intensive training in respiratory investigation and the other, Louis Cherniack in the clinical aspects of diseases of the chest. There is little doubt that the logic and clarity of the presentation was helped by the authors contact with generations of students who are often the teachers severest critics.

Because great strides have been made in recent years in the estimation of cardiopulmonary functions, new light on treatment of respiratory diseases have followed and it was inevitable that the modern trend would be in the direction of analyzing actual mechanisms of disease and not just describing them. The fresh and logical approach in this book results from the fact that respiratory disease manifests itself by certain symptoms and abnormal signs which develop as a result of a particular pathological pattern. The pattern such as atelectasis or pleural effusion may result from many causes but it is the pattern that causes the symptoms and signs elicited by the clinician not the etiologic agent of the pattern. And so individual diseases are not discussed but the mechanism whereby the symptoms and signs are produced by the various patterns of respiratory disease.

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Based upon this philosophy the authors have divided the book into four sections. Section I is concerned with the basic considerations. Taken up are breathing mechanics, gaseous exchange, respiratory function of blood and regulation of respiration. Section II is devoted to manifestations of respiratory disease. Section III deals with Patterns of respiratory disease and Section IV is a beautiful assessment of respiratory disease and the meaning of the symptoms and signs elicited by the knowledgeable clinician.

This is a book that would be valued by teachers of physical diagnosis, students of physical diagnosis, interns, clinicians and thoracic surgeons. Saunders has done an excellent printing job and the authors have produced clear and intelligible illustrations with meticulous care.

DISTURBANCES OF HEART RATE, RHYTHM AND CONDUCTION by Eliot Corday, M.D., and David W. Irving, M.D. W. B. Saunders Co., Philadelphia, Pennsylvania, 1961, 357 pp.

Reviewed by: LOUIS H. NAHUM

Books on cardiac arrhythmias are appearing frequently as they have in the past. The first classical one by Sir Thomas Lewis was probably never equalled and the recent one by Brendan Phibbs is excellent for the general practitioner. This book is written as the authors state for medical students and clinicians who require a physiological foundation for the comprehension of heart rate, rhythm and conduction. The authors also believe they have presented the latest hemodynamic principles many of which "we have pioneered." The book consists of twenty-one chapters, a long list of references and an extensive index. There are sections on mechanism, symptoms, signs and the electrocardiogram. There is a chapter on bedside diagnosis which aims to give the reader simple, practical points in the differential diagnosis of the arrhythmias. There is also a short chapter on the role of emotions in causing and perpetuating arrhythmias written by Dr. Kenneth Hamilton. The drawings are excellent, the writing facile, and lucid.

What is missing in the book is a new point of view and a scholarly development of ideas in this area. The result is a large number of facts repeated many times in the various chapters. Where attempts are made to explain the arrhythmias, it is not an explanation but a definition which emerges as for example "They occur in the intact heart as a result of some abnormal process of impulse formation." "When an irritable focus in the heart sets off an impulse during the non-refractory period." In fact, many ectopic beats occur during the relative refractory period. Phrases like "vulnerable non-refractory period" lengthened by the vagus are quite unclear. The "end of the absolute refractory period is the supernormal period" is known by students to be incorrect since when a supernormal period appears it follows the relative refractory period.

These and many others are minor physiologic aberrations and can be corrected in future editions. However, for a book to be of value to students and practitioner the mass of facts should be organized into a conceptual frame work. One such does exist in the literature at least for the tachycardias. It conceives of the regular tachycardias and ectopic beats as being caused by interaction between an exciting agent like electric shock, thyroxin, chloroform, benzol and myocardial hypoxia, with epinephrine and norepinephrine. It conceives of the irregular atrial rhythms as due to the interaction of an exciting agent and acetylcholine. In such a framework many apparently dissimilar facts fall into place and the role of emotions in the genesis of arrhythmias becomes understandable.

Aside from a theory of genesis one thing of great importance is understanding the role of the arrhythmias in changing cardiac output and flow through organs in other words the physiologic changes. The authors have devoted much space to measuring flow through kidneys, mesenteric system and carotid artery. They have discovered what had been known for a long time that certain vasopressor reflexes came into play as hypotension develops from a reduced cardiac output. Some organs like the brain and heart are privileged because life depends upon them. Therefore, they have mechanisms to avoid anoxia until the very end. A narrowed carotid during hypotension is not the measure of cerebral oxygenation. Some organs are not privileged, they can stand hypoxia for a long time, like the kidneys, mesenteric system, skin and muscles. These are the areas with vasopressor actions from which blood is shunted to sustain arterial pressure. In other words, vascular resistance in hypotension is a protective device, not a pathologic one. Of course, the problem is altered if atherosclerosis complicates the picture in any organ and this is recognized by the authors.

There are several things which students and practitioners would like in a book on the arrythmias. One that would set it apart from many others, the history of the evolution of our ideas, is not present. The definition is clearly outlined. Factors in their genesis is not well organized. Effect upon cardiac output is well portrayed. but the adaptive role of the mechanisms is not made clear. Bedside diagnosis and therapy is very adequate. The medical student who is close to his physiology will prefer his texts and will discern many unphysiologic ideas. The clinician will gain much from this book if he will be able to bypass some of the personal prejudices of the authors.

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Fillmore K. Bagatell, Simon L. Goldfarb and Diana B. Fox — **Psychiatric Education During The Rotating Internship**

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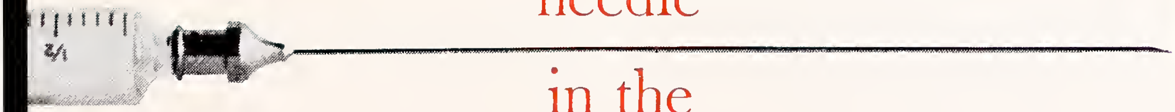

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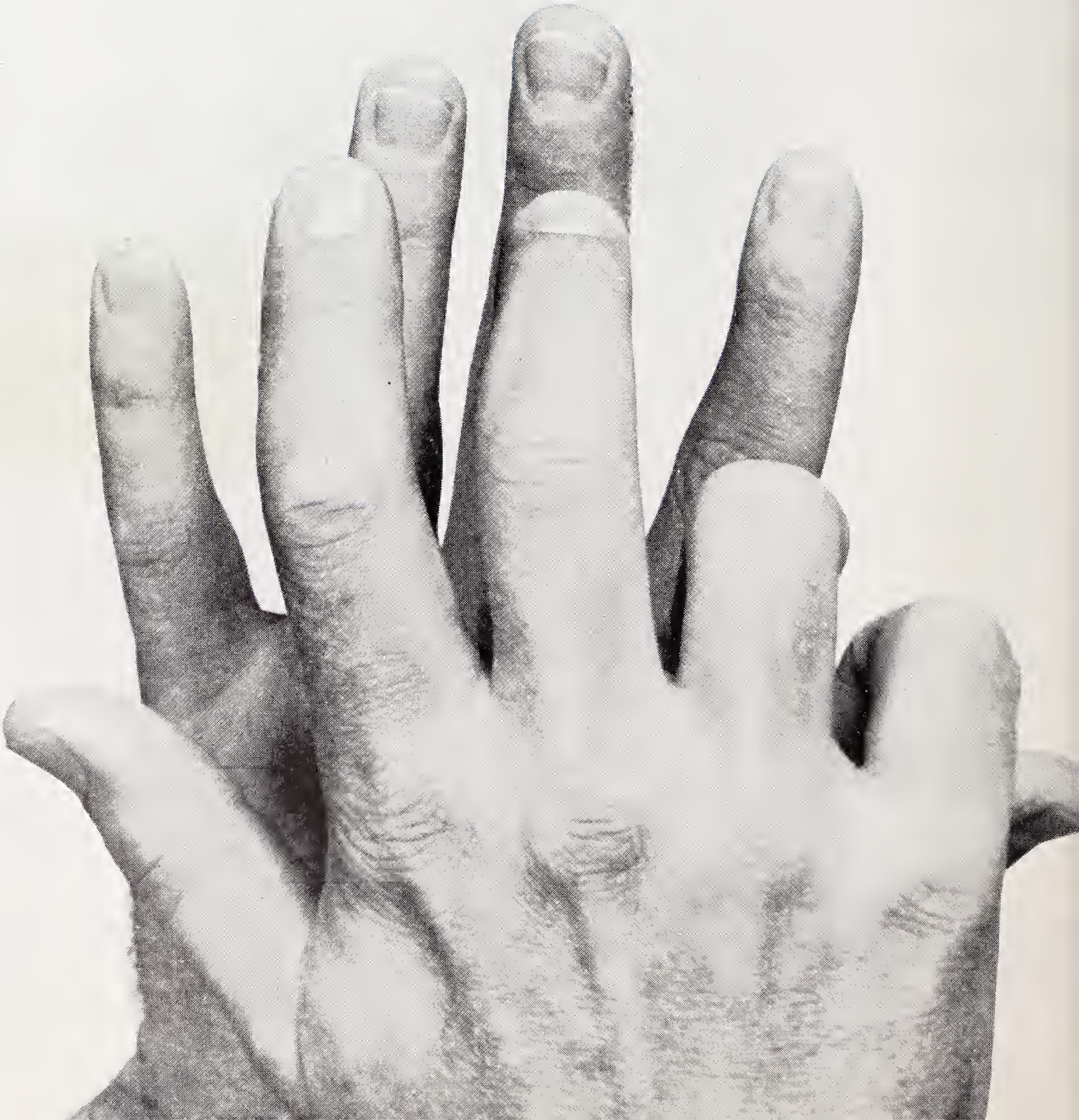

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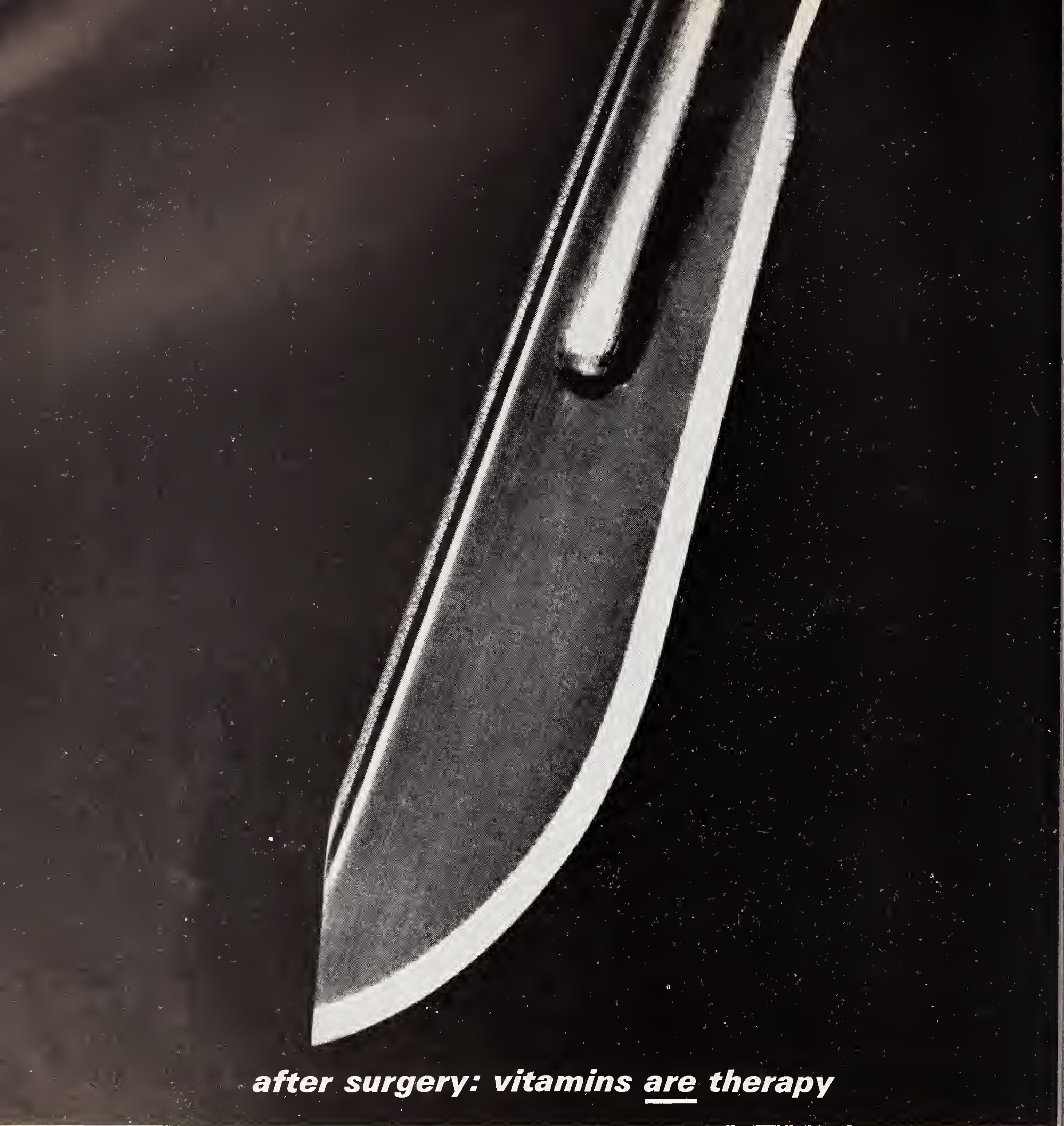

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Corneal Contact Lenses

A Review Of 100 Consecutive Cases Handled In An Ophthalmic Office

HENRY L. BIRGE, M.D.
LEON W. ZIMMERMAN, M.D.
A. B. GEORGE, M.D.
Hartford

IF it is medically advisable to handle contact lens fitting in the office of, or under the supervision of the opthalmologist, because of the danger to the eye in fitting and wearing contact lenses, more ophthalmologists will of necessity have to devote time to this problem. Among fourteen members of an ophthalmic staff in one of our large hospitals; only three actually fit these lenses and carry the patient through to complete use. This is typical of many large hospital staffs.

Our experience with direct medical supervision of this group of 100 consecutive cases may offer some points of interest to ophthalmologists and other physicians interested in contact lenses.

Methods

Following a complete examination of the eyes, the corneal lenses are ordered from the manufacturer of choice. This order includes a record of the corneal diameter, and ophthalmometer readings, together with the refractive error in diopters.

The indications for contact lenses are primarily a desire, or motivation, on the part of the patient, together with a negative series of eye findings from the point of view of active ocular pathology, including conjunctivitis, dacryocystitis, keratitis, iritis, glaucoma, conjunctival tumors or nevi, allergy, retinitis, and neurologic pathology which would be aggravated by or would hinder the easy application of the lens to the cornea.

We have not made any attempt to "sell" these lenses; on the contrary we speak of them only as alternate glasses, and continue to prescribe ordinary spectacles for all contact lens cases. We are not convinced that constant wear is physiologically sound for the cornea. It is a normal bodily reaction to produce "callous" where some object or weight is placed upon any portion of the body, and the cornea has not been proven to be free from this physiologic response.

Technique Of Fitting

When the lenses arrive they are cleaned with a proprietary antiseptic and wetting liquid, rinsed with boric acid solution and inserted by the patient, who has been instructed on techniques of placing the lenses on the cornea and of their removal. Most patients are eager to try manipulation of the lenses and only an occasional one requests help after the procedures have been explained and discussed.

The patient washes his hands, and using the wetting solution thoroughly scrubs the lens surfaces with the finger tips. After the rinse the patient balances the lens on a finger and places it on his cornea under supervision by the ophthalmologist. After the initial reaction has subsided the second lens is also inserted. No topical anesthesia is used. The fitter makes a brief check to determine if the lens holds position adequately, Acuity is checked. Then the lenses are removed and given to the patient.

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The patient is instructed to wear the lenses not over one hour at a time, two or three times a day, so he will become able to insert and remove the lenses easily. The patient is seen in a week at which time any problems which have appeared are discussed. At this visit, fluorescein is used to determine the general fitting pattern on the cornea. Daily wearing is increased by an hour or two as the patients job, school or schedule will permit. At the third visit the lenses are worn to the office and the examination made near the end of a regular wearing period. A refraction is done, over the lenses, fluorescein is used to check fit and a slit lamp study made to find if corneal staining is occuring and to check lens clearance and fit.

If the symptoms and findings support a diagnosis of a tight fit, the lens is returned to the manufacturer for adjustment. If it is too loose a new base curve may be ordered, a larger lens requested or the peripheral curves modified. If, as is usually the case, the wearing time is being increased with continued good vision, increasing tolerance and diminished irritability and the cornea shows no evidence of insult, the patient is asked to extend wear periods as tolerated but always gradually, and to wear the lenses when coming in at the next visit three or four weeks later. This appointment is arranged so the patient is seen after wear which approximates the maximum daily use achieved by this time.

Acuity is taken and refraction again done over the lenses. Examination of lens movement is made and the fluorescein pattern studied with a blue light. The bio-microscope is used to evaluate fit and to note evidence of epithelial damage. If the cornea now is free of stain, wearing time can be increased more rapidly but if a few punctate spots are visible even though the fit seems good, caution is advised. The patient usually would like to move to all day wear at once. Often at the next visit four to six weeks later, again at the end of a wearing period of several hours, the area no longer stains and full wearing is permitted.

Patients are requested to call and come in immediately if there is sharp pain, blur of vision, burning, excessive tearing or redness since these usually represent true symptoms of irritation rather than adaptive ones. If staining is found, beyond a minimum of punctate marking, wearing time is reduced until healing occurs.

When the patient wears lenses eight hours or more daily, office visits are scheduled every six months and an effort is made to make the time of examination come near the end of a full day of wear. We recommend that if patients whose acuity is normal with spectacles find they have spectacle blur which is persistent that they reduce contact lens wearing time, believing that any transient effect of edema or epithelial disturbance should disappear over night.

Results

Our two most important categories have to do with whether the lenses are worn, and if so, how efficiently; Complications are equally important.

1 — *Acceptance of Lenses*

Grade	*Cases*	*Percentage*	*Time*
Excellent	29	29%	Over 8 hours
Good	43	43%	4-8 hours
Fair	21	21%	Less than 4 hours
Poor	7 (5 refunded)		Unable to use

2 — *Complications*

Stain of Cornea	26%
Erosion of Cornea	1
Abrasion of Cornea	5
Conjunctivitis	5
Total	37%

3 — *Number of Visits*

1- 5	73
6-10	24
11-15	3

4 — *Indications*

Cosmetic	99
Aphakic	1
Total	100

5 — *Sex*

Female	79
Male	21
Total	100

6 — *Age*

Under 25 yrs.	55
25 to 35 yrs.	33
35 to 45 yrs.	7
Other	5
Total	100

7 — *Refraction*

Myopia	90	
Under 2 D		7
2 to 6 D		67
Over 6 D		16
Hyperopes	5	
Aphakia	1	
Mixed astig.	4	
Total	100	

8 — *Lost Lenses*

27 pts. (37 lenses)

9 — *Adjustments*

32 pts. (59 lenses)

We had no catastrophic cases. We had no patients develop glaucoma, or iritis, due to the use of the lenses, although we had one woman in whom a proven toxoplasmotic retinitis occurred shortly after she was fitted to contacts.

Discussion

It can be seen that 93 per cent of these cases wore their lenses. It is apparent that if our patients do not accept and wear the lenses after five visits, there is roughly only a 25 per cent chance of them using contact lenses successfully.

32 per cent of these cases had corneal epithelial changes varying from mild punctate keratitis to ulceration. Since infections from handling these lenses are constantly possible, any epithelial damage should be taken seriously. Less than 10 per cent had to stop using the lenses temporarily, and resort to antiseptics, before taking up the use of the lenses again.

We were extremely careful of the epithelium which explains in part the rather high percentage of lens modifications made compared to some other series reported. As one makes a better selection of patients and develops skill in fitting, fewer changes in lenses are needed.

Contact Lenses In Children

We have actively discouraged younger children from using these lenses, believing there is no merit in wearing contacts to arrest myopia as claimed by some nonmedical fitters. As a rule we advise teenagers not to use contact lenses until their refractive error shows signs of becoming relatively stable and no longer requires a new prescription each year. Several patients with extreme astigmatism were not encouraged to wear contact lenses because patients with such a refractive condition are less apt to be satisfactorily fitted with the conventional spherical type lenses.

Conjunctivitis And Contact Lenses

As noted in table 2, five patients developed a conjunctivitis. This was evidenced by an oily secretion rather than by discharge and seemed to be due to lid irritation rather than to infection. The condition was difficult to correct. It cleared slowly in one instance when wearing time was reduced. Wearing was later increased without return of symptoms. One patient improved after lens size was reduced. A third had this trouble during a second pregnancy but had used her lenses constantly throughout the first without symptoms. Another had chronic blepharitis which had been present for years and was only partially controlled by local medications. She was eager to use contact lenses and has been able to continue them with some limitation in wearing time so the oiliness would not be a problem. This symptom usually does not appear until after months of intensive use of lenses.

Age: Refractive Error And Vision

Table six gives the age range for this group of patients. Ages varied from *13* to *49* with fifty-five under twenty-five years of age.

Refractive status is listed in table 7. Ninety were myopes with refractive errors ranging from —1.00 to —14.00 diopters. There were five hyperopes with a range of prescription from plus 2.00 to plus 7.00 diopters. Two of these had old esotropia and did as well with contacts as with spectacles insofar as the small residual tropia was concerned. Three had errors of mixed astigmatism with the cylindric power varying from 1.50 to 3.00 diopters. Several of the myopes also had an astigmatic error of two to three diopters as did two of the hyperopes. Most of our patients wanted lenses for cosmetic reasons. A few had better acuity with contact lenses than with spectacles. A fifteen year old had an acuity of 20/50 with glasses but 20/25 with her contacts in spite of nystagmus and high myopia. Our experience with aphakic patients has been limited but we have done fairly well even without the trial set as recommended by Welch[3] who gives a good resume of the problems encountered in this particular group. Although one of the advantages claimed for a contact lens in unilateral aphakia is that binocular function can usually be restored, Dyer[4] feels there may be about eight per cent of aniseikonia, and fusion is primarily only macular if it is regained. Spaeth[5] found that in spite of the difficulties, especially in the younger age group, fitting these patients was very rewarding because of the functional improvement so gratifying to the wearer.

One patient in this series was fitted with a cosmetic lens to cover a scarred cornea. The appearance was very good. A special problem exists in such instances because the opaque lens prevents visualization of corneal clearance.

Wearing Time

If a wearing time of "constantly for all waking hours" be considered as the ideal to be desired in using contact lenses, attainment of this goal would be rated an excellent result by the fitter. Lesser periods for daily wear would rate accordingly. 4 to 8 hours maximum for daily wear might be considered good, 2, fair, and less than this, poor or unsatisfactory. However a few in the latter category enjoy wearing their lenses for an evening or special occasion and if they maintain some degree of tolerance by daily wearing are able to use lenses for a longer period now and then. Motivation and various factors effecting patient acceptance of contact lenses is discussed by Westsmith[6]. It is difficult to determine how successful contact lens wearers are. Some move away and are lost from record. Others lose interest, or motivation, and although at first are able to wear their lenses all day, may reduce their use of contacts over a period of months to sporadic wear. Some of these probably have more discomfort than they will admit in the adaptive period and when the novelty wears off and they are on their own, the incentive diminishes and constant wear isn't worth the effort. They may establish a limited schedule of wear, often happily and without evident regret or disillusionment, using contacts for special occasions and having no difficulty. Such patients do not want to come in for periodic follow examinations (which are less essential under such circumstances also) and their degree of success in wearing cannot be determined without much correspondence. Many give up completely and do not keep appointments but when seen later for a routine refraction are found to have abandoned efforts to use their lenses.

Our record (table 1) for this group of patients under the standards and circumstances given above would be 29 excellent, 43 good, 21 fair and 7 poor. A few, who were doing only fair when last seen soon after lenses were prescribed, may have improved as did a college boy who was seen only twice, once to pick up the lenses and a week later to check on progress. He was away at school thereafter but when seen at mid-term was using his lenses eight to ten hours a day. Others who were doing reasonably well may have regressed since their last visit of record.

We have few patients who use their contacts exclusively. Many wear them all day at school or work, remove them for rest at home and replace them if going out in the evening. Of this group of one hundred, five patients gave up during the adaptive period and the lenses were returned for full credit. One had considerable anxiety regarding possible harm to her eyes and probably should not have been fitted at all. The others appeared to lack motivation even though the lenses were fitting properly and acuity was good.

One of this series was an aphakic patient. He was able to wear a lens successfully as a monocular aphakic and when the second eye was done, was fitted for a second lens.

The matter of lens modification was mentioned previously. Such a procedure in this series was done for a total of 32 patients. Several had more than one adjustment made, the most was seven. This was in a case of chronic irritability and oily feeling, and included clearing, cutting of size, edge treatment, change in base curve and others. Some of the remaining patients who had no lens changes might have done better with some minor adjustment but because of incomplete follow-up schedules were not seen. The total number of lens changes was 59, including 27 lost lenses.

Lost lenses have been a problem to the rapidly growing contact lens business. Some companies refuse to insure the lenses because of loss experiences and the nature of this particular problem. In this series there were 27 lost lenses. One patient had three losses in a period of about two years.

Office Visits

The number of office visits required to complete a case is a matter of importance. We have arbitrarily planned to see each patient one week after giving them the lenses, then two, four and eight weeks afterward and every six months thereafter. If any problem develops this tentative schedule is modified as necessary. We emphasize the importance of periodic checking even though the wearer is comfortable and has no symptoms, believing, as does Jaeckle[9], the dangers inherent in these lenses to be real and the limitations entirely different from those related to spectacle use. Patients become very casual about wearing contacts and get careless about proper hygiene, acquire faulty habits of wear and increase the opportunity for potential complication. This group of patients required from two to eight visits each during the adaptive period (arbitrarily three months) with an average of 3.7 visits. This includes five patients who had unusual difficulties over a period of about six months, one of whom was seen fifteen times in that period.

Other Complications

The incidence of abrasion or corneal erosion sufficient to produce pain and necessitate withholding lenses until healing occurred, with or without modification of the lens, was five (table 2). Subsequently wearing was resumed without difficulty. One patient sustained a corneal wound from pushing her lens on the cornea from the conjunctival sac on insertion. She habitually placed her lenses on the sclera and slid them on the cornea with her finger tip. In this instance evidently a fingernail abrasion occurred. This patient continues to insert her lenses in this way in spite of repeated warning, discussion and practice of proper techniques in the office. One other patient also is unable to overcome this natural reluctance to touch the cornea and puts her lenses in the conjunctival sac. Both are good wearers.

One patient was struck in the eye by a finger, in a scuffle, and received a minor trauma to the palpebral conjunctiva but the corneal lens protected that surface and remained in place.

One patient developed coarse cobblestone staining of both corneas while wearing her lenses constantly. There was no discomfort and visual acuity was good since the central area was uninvolved. The patient would not give up using the lenses to allow the epithelium to heal or to permit any lens modification. Oddly enough though daily wear continued full time, the staining gradually diminished and the area involved regressed to a small marginal spot when last seen. No medication was used. This patient was from another city and would not return regularly so the subsequent course is unknown. One wonders if this individual has had trouble and is being seen elsewhere or is using lenses still asymptomatically, yet with epithelial change which would be evident by staining.

There was no instance in which the original lenses had to be increased significantly in power to maintain correction of the refractive error. However, our youngest patient was thirteen and only three under sixteen so essentially an adult state was present in all of these eyes when lenses were fitted initially. None have been followed for over three years so possibly further changes may occur.

Of those who developed corneal erosion, abrasion or staining of medium degree, eight removed the lens for periods varying from five days to two weeks or until staining disappeared. Then wearing was resumed in gradually increased periods until full adaption was again attained.

Girard[7] outlines contact lens problems at length and proposes solutions for many including standardization of maufacturing and regulations governing fitters. Our experience has been smaller than many but we have been impressed by the multitude of makers, the promotional aspects and the minimizing of dangers which seem predominant in informational brochures. We have tried to make our patients realize that these lenses have potential for harm and to warn users that supervision is essential as long as one wears contact lenses.

Another good analysis of contact lens practice is made by Agatston[8], who defines the role of the ophthalmologist and lists advantages of contact lenses. One of the important contraindications to accepting a patient for fitting is nervous tension or emotional stress manifested in the eyes by squinting, excessive blinking, resistance to manipulation of the lids, etc. However, if motivation is strong, even some of these patients can be successfully fitted. One of our patients became faint when one lens was inserted initially and the second could not be put in. The first was removed with difficulty and the fitter expected the patient to quit at that point or at least prefer another visit for practice and familiarization. Instead the lenses were taken home, inserted with the assistance of a friend who was a wearer of contact lenses and no further trouble occurred. This patient now uses lenses all day.

Summary

There is increasing awareness among ophthalmologists of the need for medical leadership and supervision in contact lens work. The manufacturing problems which for years were so formidable now are being solved and it is the clinical aspects which need clarification. In this phase the oculist can help most.

We have presented our experiences with a series of one hundred patients and indicated some of the difficulties. The initial exuberant enthusiasm for this new aid to vision has been replaced by an awareness of its usefulness tempered by recognition of limitations.

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Psychiatric Education During The Rotating Internship

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This communication deals with the experience of a rotating intern in a community general hospital during the elective month in an outpatient adult psychiatric clinic. The clinic is one of a group of twelve psychiatric clinics in general hospitals, all of whom receive some financial assistance under a program administered by the Community Services Division of the Connecticut State Department of Mental Health. This clinic was established in 1946. It provides diagnostic and treatment services for lower and middle income patients with all psychiatric disorders except alcoholism or addiction. The sources of referral are all services within the hospital, private physicians, community agencies, and self-referrals. While there is the usual clinic team, major treatment responsibility is carried by four part-time psychiatrists with the social worker actively participating at all levels. The psychologist's time is used primarily for testing when this seems indicated. The usual procedure is for the social worker to see all patients for intake and the clinic director to interview the eligible ones for psychiatric evaluation and allocation. The average case load per month is 85. The psychiatric classification of the patients does not vary to any considerable degree from the national average for all clinics of this type, as cited by the National Institute of Mental Health.[1]

Through the years, intermittently, the clinic has attempted to provide some educational experience for interns, but no definite program had been evolved. This elective time offered us the opportunity to plan a program that would provide a meaningful experience for the intern, as a result of which this program is being continued as part of the rotating internship. With this in mind, it was decided that the greatest educational benefits would be derived from intake interviewing and a limited exposure to therapy. During this one month period, the intern was assigned not only to the clinic, but also to the psychiatric service of the hospital. He was required to be present at all psychiatric consultations in the emergency room, the general outpatient clinics, and on all staff service consultations. The intern would see these patients first and give a report of his observations to the attending psychiatrist, who, after examining the patient, would review the problem with the intern. The intake interviews were discussed in regularly scheduled bi-weekly conferences with the clinic director. At these meetings the patient's history was reviewed, the conduct of the interview was explored, and the psychodynamics were discussed.

It was not the intention of the electing intern to survey the area of psychiatry as a possible career, but to gain insight into patients' emotional needs, particularly with respect to psychosomatic illness. With this frame of reference, teaching material to satisfy this interest was selected. The approach undertaken was to permit the intern, after a few days of careful supervision and orientation, to do

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[1] Data on Patients of Outpatient Psychiatric Clinics in the United States, National Institute of Mental Health, Outpatient Studies Section, Biometrics Branch. Bethesda 14, Maryland. December 1961.

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TABLE I
CLASSIFICATION OF PATIENTS SEEN ON INTAKE INTERVIEWS DURING A ONE-MONTH PERIOD BY THE ROTATING INTERN*

PATIENT	AGE	SEX	PSYCHIATRIC CLASSIFICATION[2]	SOCIAL CLASSIFICATION[3]	DISPOSITION
1	27	F	Inadequate Personality	IV	Referred to private physician
2	32	M	Phobic Reaction	IV	Accepted for treatment
3	30	F	Personality Trait Disturbance	IV	Referred to private physician
4	54	F	Schizophrenic Reaction, Chronic Undifferentiated type	II	Referred to private physician
5	19	F	Mental Deficiency	V	Accepted for treatment
6	45	M	Anxiety Reaction	III	Accepted for treatment
7	34	M	Schizophrenic Reaction, Paranoid type	V	Referred to state hospital
8	21	F	Schizophrenic Reaction, Acute Undifferentiated type	V	Accepted for treatment
9	47	F	Adult Situational Reaction	V	Referred to case work agency
10	29	M	Personality Pattern Disturbance	III	Referred to private physician
11	47	M	Schizoid Personality	V	Referred to welfare agency
12	32	M	Personality Pattern Disturbance	IV	Accepted for treatment
13	62	M	Anxiety Reaction	V	Accepted for treatment
14	31	F	Manic Depressive Reaction	V	Accepted for treatment
15	19	F	Conversion Reaction	IV	Accepted for treatment
16	16	F	Depressive Reaction	V	Accepted for treatment
17	37	F	Schizophrenic Reaction, Acute Undifferentiated type	IV	Accepted for treatment
18	29	M	Drug Intoxication, with Behavioral Reaction	IV	Accepted for treatment

* This does not include patients seen by the intern in the emergency room and on the in-patient service.

all initial intake interviews scheduled. It was also arranged that the intern was to be called to the emergency room for acute psychiatric emergencies during this month. In addition, contacts were made by him with interested individuals and agencies, including family members, schools, rehabilitation services, physicians, courts, etc. The intern also visited several psychiatric facilities, such as a narcotics addiction center and a psychiatric day treatment hospital. He attended clinic staff meetings and all other pertinent meetings during the month in which members of the clinic participated. The clinic library and all case records were made available to him, with specific basic readings suggested by the clinic director and relevant closed case material recommended by the social worker when considered helpful for heightened understanding of particular cases.

The diagnostic classification of patients seen by the intern during his month in the clinic is shown in Table I. This table shows the age, sex, psychiatric classification,[2] social classification,[3] and eventual disposition of these patients. Social class groups seen, largely IV and V, conform with the population segment to be served by the clinics in community general hospitals. The age distribution is broad, with 33 as the average age of patients seen. Overall, it can be seen that classification of patients seen by the intern includes 5 Psychotic Disorders, 6 Personality Disorders, 5 Psychoneurotic Disorders, 1 Mental Deficiency Idiopathic, and 1 Drug Intoxication with Behavioral Reaction. While certainly not complete, it did provide a broad basic introduction to what one might encounter in the general practice of medicine.

Under the guidance of one of the attending psychiatrists, medication was prescribed by the intern, where indicated. This served to include the use of drugs in modern day psychotherapy, in his continuing education.

Two major areas in the continuing education of the intern were covered by this experience. These include increased insight into the psychological factors in illness, which is an essential for the non-psychiatric medical and surgical practitioner. In addition, this experience provided introductory exposure to the treatment of the ambulatory psychiatric patient. Some valuable experiences relevant to general medical practice are:

1. Opportunity afforded to see, evaluate, and treat individual patients in contrast to mere observation characteristic of medical school classroom exercises.

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[2] Diagnostic and Statistical Manual, Mental Disorders, American Psychiatric Association, Mental Hospital Service, Washington 6, D. C., 1950.

[3] Hollingshead, A., A Two Fact Index of Social Position. New Haven, Connecticut. 1957.

2. Enhanced ability to conduct a skilled interview within the limits of a specific time period.

3. Increased awareness of psychodynamics. This improved powers of discrimination with respect to selection of patients for psychiatric referral. Thus, the practitioner in other specialities is freed to deal more satisfactorily with those patients he can help.

4. Learning to listen, observe, and be accepting, without becoming emotionally involved in the patients' feelings to the point of being forced into initiating medical therapy.

5. Increased self-assurance to maintain composure in the face of sudden anxiety-provoking behavior on the part of the patient.

6. Realization that patient's chief complaint as registered by him might not be the real cause for his visit.

7. Increased knowledge of the psychiatric services available to the house staff when one of their fellows was on this service.

8. Appreciation of the role of community social agencies in the treatment of patients.

9. Finally, experience gained in the practical use of pharmacology in modern day psychiatry and the limitations thereof.

The beginning exposure to the treatment of the ambulatory psychiatric patient could help crystallize for the intern his interest in psychiatry as his specialty. The clinic director's evaluation of his suitability could be helpful in making a decision. Probably the most significant aspect of even this brief experience in clinical psychiatry for the young physician interested in other medical disciplines is, whatever his ultimate practice, an appreciation of what psychiatry is and what its limitations are.

It was felt in the beginning that the one month rotation of an intern through our out-patient psychiatric clinic might possibly disrupt clinic program. It has been found, on the contrary, to have worked quite well, and is being continued. As viewed by the clinic staff, the benefits of the program were:

1. Opportunity to educate an important group of future medical practitioners. The young doctors thereby learn to understand the needs of emotionally disturbed people. This would apply to those interns going on to non-psychiatric practice. It could also serve to implement recruitment to psychiatric specialization.

2. Stimulation provided by students.

3. Facilitation in screening of patients applying to the clinic for treatment because of pre-examination of patient by intern.

4. Better integration of the psychiatric clinic as a functioning unit in a general hospital.

Summary

This report describes the educational program for a rotating intern during a one month elective period in an adult out-patient psychiatric clinic in a community general hospital. Due to the limitations of the time period, the training method selected for the intern was limited to the conduct of intake interviews and short-term therapy under supervision. The mutual advantages of this type of training for both the intern and the clinic are discussed.

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Recent Advances In Auscultation And Phonocardiography

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The measurement of pressures, flows and resistances in the heart and pulmonary circulation has revolutionized our knowledge of cardiac hemodynamics; and the development of phonocardiography has enabled graphic recordings of heart sounds and murmurs to be accurately related to these events.[1-3] The importance of auscultation in the diagnosis of heart disease has been extended by phonocardiography. It is now possible to achieve a mark of accuracy in the anatomic and pathophysiological diagnosis of congenital and acquired heart disease through a reasonable knowledge of the basic principles in auscultation. It is the purpose of this report to review briefly some of the recent knowledge of the physiology of heart sounds and murmurs, and to emphasize the diagnostic value of a careful study of these acoustic events.

The Stethoscope

Laennec published his book on auscultation in 1819 and during the next one hundred years to the death of Sir William Osler in 1919, the stethoscope has undergone many alterations and refinements, and it now consists of several parts. From the original rigid monaural device has come the flexible binaural models, fetoscope, symballophone and electronic stethoscopes of today.

The stethoscope is portable, informative and adaptable in many situations, and its use is not limited to the chest. Auscultation of arteries is a worthwhile investigation, particularly in patients who may have an arterial stenosis caused by atherosclerosis. A systolic murmur indicates the exact site of an area of arterial stenosis. In the upper limb, the greatest use of arterial auscultation is in patients with aortic arch syndrome and cervical ribs or the thoracic outlet syndrome in which a systolic murmur over the subclavian artery is a common finding. The location of an arteriovenous fistula, stenosis of a renal or mesenteric artery and the diagnosis of an intradural spinal angioma may be made by a bruit over the lesion.

Second Heart Sound

The first and second heart sounds must be interpreted in the light of asynchrony between the two ventricles causing splitting of sounds.[4] Knowledge of the splitting of the second heart sound and its behavior during respiration is of great diagnostic value. Splitting of the second heart sound in the pulmonary area during inspiration into an earlier aortic component, and later pulmonary, can be readily detected in most children and young adults, and in many older subjects. During inspiration, augmentation of right ventricular filling occurs; the right ventricular stroke volume is increased so that pulmonary valve closure is delayed and splitting is wide. During the expiratory phase of respiration, the increased stroke volume of the right side is ejected from the left ventricle so that aortic valve closure is delayed and is synchronous with pulmonary valve closure.

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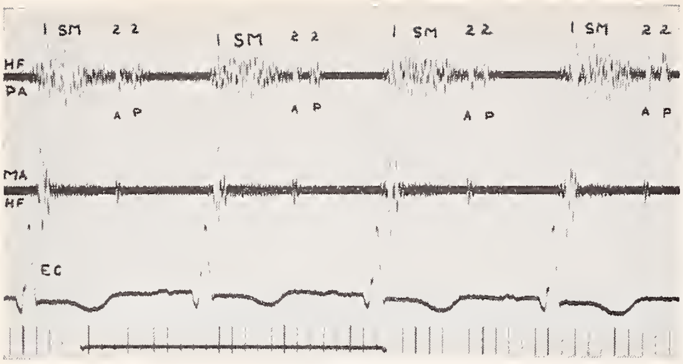

Figure I

The phonocardiogram from a patient with an atrial septal defect is taken from the pulmonary area (PA) and mitral area (MA). An ejection systolic murmur (SM) follows the first heart sound (1), ending before aortic valve closure (A). Wide and relatively fixed splitting of the second sound into aortic and pulmonary components (A-P) is present.

In patients with atrial septal defect, wide and relatively fixed splitting of the second heart sound is conspicuous. In this condition, increased filling during inspiration produces pressure and volume changes in the right atrium which are directly reflected to the left atrium through the atrial defect so that aortic and pulmonary valve closure moves together and in the same direction. Wide and relatively fixed splitting of the second sound (0.04 to 0.05 second) has proved the most useful sign of atrial septal defect and this condition is readily detected because the systolic murmur ceases well before both components of the second sound[5,6] (Fig. 1). The wide splitting also indicates that the main shunt is from left to right. With reversal of the shunt from pulmonary hypertension, the splitting narrows or disappears and this is a useful clinical indication that the condition is inoperable.

Wide splitting of the second heart sound in the expiratory phase of respiration with aortic closure preceding pulmonary closure may be caused by early closure of the aortic valve due to diminished resistance to left ventricular ejection as in mitral regurgitation, but this is more commonly caused by abnormal delay in pulmonary closure. The electrical activation of the right ventricle is delayed in patients with complete right bundle branch block and pulmonary valve closure is delayed, resulting in wide splitting of the second heart sound. Pulmonary valve closure is also delayed in patients with pulmonary stenosis since right ventricular systole is prolonged, owing to resistance in the right ventricular outflow tract, and wide splitting is characteristic (Fig. 2). In both conditions, splitting is less pronounced during expiration.

Parodoxical splitting of the second heart sound is a valuable physical sign of complete left bundle branch block, severe aortic stenosis, coarctation of the aorta and systemic hypertension. Aortic valve closure is delayed by late electrical activation of the left ventricle or by prolongation of left ventricular systole so that aortic valve closure follows pulmonary valve closure, and splitting is wide during expiration.

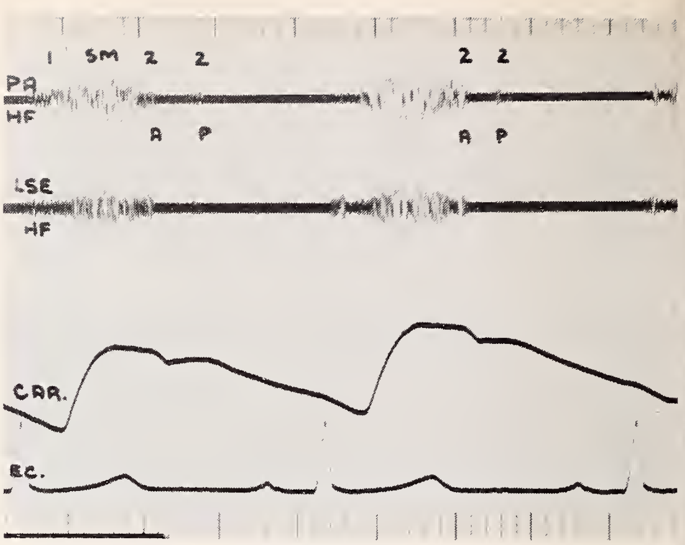

Figure II

The phonocardiogram from a patient with pulmonary valve stenosis is taken from the pulmonary area (PA) and left sternal edge (LSE) with high frequency filters (HF). The ejection systolic murmur (SM) begins after the first heart sound (1), ending with aortic valve closure (A). There is wide splitting of the second heart sound (2) into aortic and pulmonic components (A-P), wider during inspiration. Aortic valve closure is synchronous with the dicrotic notch of the indirect carotid pulse.

Opening Snap

Vibrations associated with opening of the atrioventricular valves in early diastole are normally inaudible, but become accentuated and audible in patients with mitral and tricuspid stenosis. The phonocardiogram frequently shows both aortic and pulmonary valve closure and an opening snap in the pulmonary area and at the right sternal edge (Fig. 3). The opening snap of mitral stenosis is high-pitched and sharp, is maximal at the lower end at the sternum, but well-transmitted to the base; it is usually obvious at the pulmonary area. The opening snap and its timing with aortic valve closure reflects the severity of diastolic gradient across the mitral valve. Late snaps (0.08 second and more) suggest mild mitral stenosis.[7,8] In 12 subjects with mitral regurgitation, a loud opening snap was heard. At operation, a constant finding was the association of a relatively healthy aortic cusp with marked deformity and immobility of the mural cusp. This suggests that the opening snap was caused by a pliant aortic cusp moving abruptly under the influence of a high left atrial pressure.[9]

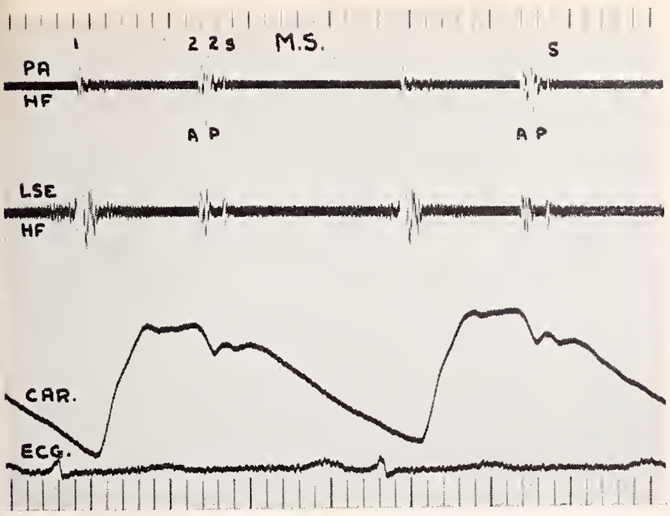

FIGURE III

The phonocardiogram from a patient with mitral stenosis is taken from the pulmonary area (PA) and left sternal edge (LSE) with high frequency filters (HF). A loud first heart sound is present (1) and the second heart sound (2) is split into aortic and pulmonic components (A-P). An opening snap (S) measures 0.07 second after aortic valve closure which can be differentiated from the components of the second heart sound.

Ejection Sound

Early high-pitched systolic ejection sounds are related to dilatation of the aorta or pulmonary artery. Aortic ejection sounds are synchronous with the carotid rise or opening of the aortic valve after a short period of isometric contraction. Unlike the well-localized pulmonary ejection sound which is diminished in intensity during inspiration, aortic ejection sounds are transmitted to the apex and tricuspid area and show no respiratory variation. The aortic ejection sounds are noted in aortic stenosis, truncus communis, extreme cases of Tetralogy of Fallot, and only occasionally in coarctation of the aorta, transposition of the great vessels, tricuspid atresia, aortic regurgitation and atherosclerosis of the aorta. Pulmonary ejection sounds are present in mild and moderately severe congenital isolated pulmonary stenosis, idiopathic dilation of the pulmonary artery, the Eisenmenger physiology with pulmonary artery dilatation (Fig. 4) and the Taussig-Bing complex.[10] The ejection sound is high-pitched, always preceding the ejection systolic murmur in patients with valvular stenosis or dilatation of the large vessels.

Ventricular Filling Sounds

Ventricular filling sounds are low-pitched and heard best with the bell of the stethoscope applied lightly to the chest wall. Atrial sounds occur after the electrical activation of the atrium during atrial systole, preceding the first heart sound. This sound probably indicates resistance to ventricular filling in patients with systemic hypertension, outflow tract obstruction of the right and left ventricle and cardiac decompensation. Atrial sounds are also well heard in patients with complete heart block and sometimes in normal subjects with a prolonged PR interval. In hypertension and ischemic heart disease the atrial sound approaches and may fuse with the first heart sound during clinical improvement. With deterioration, the atrial sound moves in the reversed direction.[11, 12]

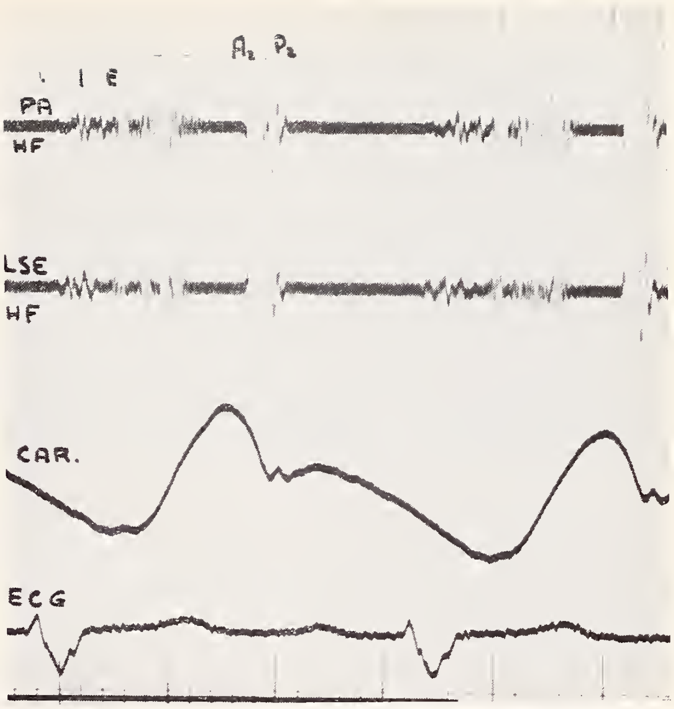

FIGURE IV

The phonocardiogram from a patient with ventricular septal defect and severe pulmonary hypertension (Eisenmenger complex) shows the pulmonic ejection sound (E) following the first heart sound (1) and introducing a short, mid systolic (ejection) murmur. The second heart sound is loud and single (A2-P2).

The ventricular diastolic gallop occurs during the rapid filling phase of the cardiac cycle and is an excellent indication of cardiac decompensation or ventriculoatrial regurgitation. Physiological third heart sounds occur frequently in children and young adults, but are rarely heard in normal subjects over the age of 40 years. In patients with mixed mitral stenosis and regurgitation, the presence of a loud third heart sound (0.12 to 0.16 second) after aortic closure indicates rapid filling from left atrium to ventricle, and significant stenosis is minimal. These patients are not decompensated as evidenced by a normal end-diastolic pressure in the left ventricle. The phonocardiogram and simultaneous indirect carotid pulse tracing are extremely helpful in the differentiation of a late pulmonary valve closure from an opening snap and ventricular diastolic gallop (Figs. 2, 3 and 5).

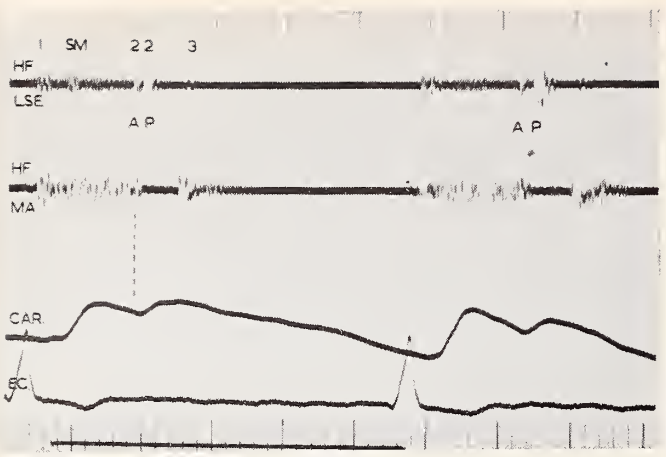

FIGURE V

The phonocardiogram from a patient with severe mitral regurgitation shows a pansystolic murmur (SM) beginning with the first heart sound (1) and ending with aortic valve closure (A). Wide splitting of the second heart sound (A-P) can be differentiated from a late third heart sound (3) which measures 0.14 second after aortic valve closure.

A single loud gallop present during tachycardia may either be an augmented gallop or a summation gallop. The distinction can be made only when the heart rate is slowed, at which time the true summation gallop will change to quadruple rhythm while the augmented gallop remains a single sound of reduced intensity.[13]

Murmurs

The registration of murmurs by the phonocardiogram gives a visual record of what is heard through the stethoscope. The pattern of the murmur is found to be related to the anatomical or hemodynamic disturbance. Changes in velocities of blood flow are responsible for changes in the intensity of the murmur.

Systolic murmurs can be classified by noting the timing and shape in relation to the first and second heart sounds.[14] The graphic illustration of systolic murmurs may be:

(a) ejection systolic murmurs
(b) pansystolic murmurs
(c) late systolic murmurs
(d) early systolic murmurs

Ejection systolic murmurs are caused by forward flow of blood through aortic or pulmonary valves. Turbulance is created in valve stenosis, valvular roughening without stenosis, post-stenotic dilatation, increased velocity of flow (hyperkinetic states), or a combination of these factors. The murmur is mid systolic, increases in intensity about mid systole and diminishes with the flow during the latter part of systole. The murmur begins as blood is ejected into the great vessels, after a period of isometric contraction (Fig. 4). These murmurs are well- transmitted to the apex and along the carotid vessels in patients with aortic valvular disease. The ejection murmur of pulmonary stenosis may actually envelope aortic valve closure, but always finishes before the delayed and soft pulmonary component which can be seen on the phonocardiogram. Ejection systolic murmurs due to aortic or pulmonary valve stenosis, increased pulmonary flow from left to right shunts, may be differentiated by analyzing the second sound in the pulmonary area.

The use of amylnitrite in the diagnosis of systolic murmurs is well described. Left and right sided ejection murmurs, with the important exception of those due to Fallot's Tetralogy, increase in loudness because of increased forward flow. The intensification is greater and more sustained when the murmur is due to stenosis rather than increased flow without stenosis. The chief value of the amylnitrite inhalation test is in the differential diagnosis of ventricular septal defect from pulmonary stenosis; pulmonary stenosis from mild or acyanotic Fallot's Tetralogy; atypical patent ductus from other pulmonary systolic murmurs; aortic stenosis from mitral regurgitation; and mitral regurgitation from tricuspid regurgitation and in assessing whether a mitral or tricuspid systolic murmur is due to organic valvular disease or not.[15]

Pansystolic murmurs in patients with mitral and tricuspid valve regurgitation or ventricular septal defect may be confirmed by phonocardiography. They are caused by a flow of blood from the chamber or vessel that is at a higher pressure throughout systole than the receiving vessel or chamber. The murmur begins with the first heart sound and is generally of regular frequency and ends with aortic valve closure. (Fig. 5).

In patients with ventricular septal defect and normal pulmonary artery pressure, a loud pansystolic murmur is localized at the third and fourth left interspace. Wide splitting of the second heart sound may be present at the pulmonary area.[16] In ventricular septal defect complicated by pulmonary hypertension, the murmur is ejection in type and pulmonary valve closure is accentuated (Fig. 4). Intracardiac phonocardiography demonstrates the pansystolic murmur to be localized within the right ventricle and is a diagnostic sign of uncomplicated ventricular septal defect, even when clinical and catheterization findings are equivocal. In ventricular septal defect complicated by pulmonary hypertension or pulmonary stenosis, the murmur is always present with left to right shunt and is proportional in duration and intensity to the volume of the shunt. Intracardiac phonocardiography can also demonstrate the murmur of a small muscular ventricular septal defect in those patients in whom a left-to-right shunt cannot be demonstrated by oxygen step-up, dye dilution or nitrous oxide inhalation.

The late systolic murmur is consistent with mild to moderate mitral regurgitation. The murmur is maximal in late systole, and a phonocardiogram may be necessary to show early vibrations beginning with the first heart sound. The late crescendo systolic murmur may be attributed to ballooning and incompetence of the atrioventricular valve cusps as pressure in the ventricle increases during mid and late systole.[17]

There are rare patients with loud systolic murmurs at the lower left sternal edge which are confined to early systole, beginning with the first heart sound. No disturbance of hemodynamics can be detected, and no left to right shunt can be demonstrated by dye dilution technique, radioactive krypton or even selective left ventricular angiography. It is possible that during mid and late systole the defect is closed when the ventricle is fully contracted.[16]

Diastolic murmurs due to aortic or pulmonary regurgitation start early or immediately after closure of the incompetent semilunar valves because of the rapid appearance of a difference in pressure between the great vessels and the ventricles. The murmur may swell up to a crescendo soon after the second sound and then diminish with the falling diastolic pressure. These murmurs are caused by aortic and pulmonary valve disease or valve ring dilatation, aortic aneurysms and pulmonary hypertension. Differentiation may be difficult, but the site of the maximal intensity is of some value (aortic murmur at the third and fourth interspace and the pulmonary at the second). The murmur of pulmonary regurgitation not associated with pulmonary hypertension is characteristically low-pitched and short, and usually has a well marked crescendo-diminuendo configuration. If faint, it can be recognized and recorded more easily after noradrenaline.[18]

The ventricular filling murmur of atrioventricular valve stenosis is always low-pitched because of the relatively small difference in pressure between atrium and ventricle, and the relatively low velocity of blood flow. The duration of the murmur is now widely appreciated as the best guide to the degree of mitral narrowing since prolongation of the duration of rapid ventricular filling by severe stenosis must be accompanied by a loud murmur. The loud sharp first heart sound and the low-pitched diastolic rumble at the apex initiated by an opening snap are the characteristic findings of mitral and tricuspid stenosis. In patients with tricuspid stenosis, auscultation should begin at the cardiac apex where the murmur of mitral stenosis is most evident, and proceed in small increments toward the left lower sternal border. The mitral murmur will often fade between the apex and low left sternal border before the tricuspid murmur becomes evident. The area where the murmur of tricuspid stenosis should be sought is along the left lower sternal border, usually localized to the fourth or fifth intercostal space, but is occasionally heard in the third intercostal space. Inspiratory augmentation of intensity of tricuspid diastolic murmurs is the most valuable auscultatory sign. This should be demonstrated during continuous respiratory excursions. The murmur of mitral stenosis either remains unchanged or gets fainter during inspiration. In patients with tricuspid stenosis, simultaneous right atrial and ventricular pressure pulses when recorded with a double lumen catheter show that the transvalvular gradient is seen to increase during inspiration and to decrease during expiration.[19]

Summary

Cardiac auscultation in health and disease is an art in which competence is acquired with experience and effort. Careful study at the bedside and careful interpretation of auscultatory findings by phonocardiography may provide a clinical diagnosis in most patients with congenital and acquired heart disease.

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The relationship of headache to idiopathic epilepsy has received much attention. This is based on the frequency of headaches in individuals with epilepsy, the appearance of headache as a postictal phenomenon,[5] the occurrence of migraine as a familial disorder in the histories of epileptic patients,[3] and the occurrence of headache as an aura.[4] In addition, the ictus may be manifested only by recurrent, paroxysmal headache. This latter condition—headache as an epileptic equivalent—is rare.[4] Migraine headaches have been considered by some to be a form of autonomic epilepsy.[3] In addition, paroxysmal headaches may be associated with epileptiform activity in the electroencephalogram.[13]

Headache may also occur in association with varieties of epilepsy other than idiopathic. Not infrequently, both may occur following various degrees of cranial trauma. In these instances the convulsive disorder is presumed to arise as a result of parenchymal damage, or the trauma may be a precipitating factor in unearthing seizure activity in individuals whose family history suggests a genetic predisposition to epilepsy. Transient injury of cell membranes and disturbances of intracellular metabolic processes may be another factor in the production of seizures after cranial trauma.[10]

Two recent cases suggested to us the possibility that in some rare instances, headache and epilepsy occurring after head injury may have a causal interrelationship. In these cases, headache may represent an epileptic prodrome, an aura, or even an equivalent.

CASE REPORTS

Case 1

#217-109. J. A. A 27 year old nurse was admitted in August 1961. Six weeks earlier she had sustained a sharp blow in the left occipital area, dazing her. Immediately thereafter she noted generalized headache which soon became lateralized to the left side. The headaches occurred daily, in late afternoon or evening, beginning in the occipital area and radiating forward toward the left eye. Three weeks after the injury the patient was noted by her family to have a staring appearance of the left eye. No ophthalmologic cause was found for this, and six weeks after injury the patient was admitted for neurosurgical evaluation. Her daily headaches had gradually become more severe.

Examination: B.P. 134/80, P. 80. There was a staring appearance of the left eye due to abnormal retraction of the left upper lid. No other neurologic abnormality was noted. General examination was also normal.

Roentgenograms of the skull were normal. Lumbar puncture disclosed an opening pressure of 140 mm. H20; the fluid was clear, with no cells. CSF protein was 29 mgm. per cent. A left carotid arteriogram was performed. This revealed no abnormality. An electroencephalogram disclosed slowing in the left mid-and posterior hemisphere. Random sharp waves were seen, more often on the left side.

It was felt that the patient's symptom represented a "post-concussion" headache. The cause of the lid retraction remained unknown. Since analgesics had failed to affect the headaches, and since they were unilateral, the patient was discharged on ergot preparations.

At home, her symptoms continued unchanged. Five days after leaving the hospital, in association with her daily head-

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ache the patient noted numbness beginning in the right (contralateral) hand, spreading to involve the right arm and right side of the face. The episode lasted about 30 minutes. When she reported this the following morning, it seemed apparent that she had experienced a sensory seizure, and Dilantin 100 mgm. three times daily was started. That evening, for the first time since her injury, the patient had no headache. This symptom has never returned while Dilantin has been maintained. The patient quickly resumed all activities without complaint. In the next six months the abnormal lid retraction gradually disappeared. Five months after beginning Dilantin, a repeat EEG showed definite improvement, although with persistent low-voltage sharp activity, chiefly leftsided. At about this time, Dilantin was stopped. Three days later the left-sided headaches recurred; Dilantin was resumed and the patient continues to be asymptomatic.

Case 2

#217-358/W.W. A 14 year old boy admitted August 1961. The day before admission he had been struck in the right temporoparietal area by a baseball. He was stunned and briefly confused but not unconscious. Skull films taken as an out-patient showed no abnormality and aside from apathy the patient appeared well. At home that night he complained of severe generalized headache and vomited several times. He was hospitalized for the first time the following day and seen in consultation by the neurosurgical service. Examination: B.P. 110/70, P. 80. The patient was apathetic and drowsy, but there were no focal neurologic abnormalties. General examination was normal. The patient denied headache at that time. A diagnosis of "post-concussion syndrome" was made. Continuous close observation was recommended and an electroencephalogram requested. This was reported as follows: "markedly abnormal; dysrhythmic with high voltage slowing in right posterior temporal, central, and parietal areas. Compatible with cerebral contusion . . . or raises the question of post-ictal abnormality."

The following day the patient complained of generalized headache but was otherwise well, and was discharged on the third day. One week after discharge he was seen again; at this time he complained of severe generalized headache, nausea, dizziness, and weakness. Headache was most marked in the right temporoparietal region; it was persistent but tended to periodic exacerbations. Examination again was normal except for continued apathy. Mild analgesics and Dramamine were prescribed and the boy returned home. That night his symptoms abated rapidly; the following morning only a mild residual headache remained. At about noon that day, however, the patient was noted to stare into space and failed to respond at times when spoken to. He again complained of severe headache and kept his hand pressed to the right side of his head. He was rehospitalized.

Examination: No significant change in vital signs. The patient spoke little and stared constantly. He was poorly cooperative, but neurological evaluation suggested a slight drift of the left arm when extended. No other abnormalities were noted. The presence of headache could not be ascertained.

It was the impression that the patient's condition represented a post-ictal phenomenon. A lumbar puncture revealed an opening pressure of 120 mm. h20. The CSF was clear, with no cells, and a protein of 40 mgm. per cent. Following the lumbar puncture, Phenobarbital 120 mgm. and Dilantin 100 mgm. were given intramuscularly. One hour later the patient had a generalized convulsion. This was controlled with additional Phenobarbital. Following the seizure the patient remained drowsy; anti-convulsant medication was continued on regular schedule.

The following morning the patient was dramatically asymptomatic. He was fully alert, and hungry. Most striking was the absence of headache, which the patient now stated was completely gone for the first time since his injury. Dilantin 100 mgm. and Phenobarbital 30 mgm. three times daily were maintained. The patient remained asymptomatic and was discharged four days later. He has resumed all activities with no recurrence of seizures, headache, or other symptoms. Neurological examination at the present time is normal.

An additional feature is noteworthy in this case; a paternal uncle had generalized seizures for about ten years in early life. These subsided spontaneously.

Discussion

Post-traumatic headache has been attributed to a variety of mechanisms, principally damage to the soft tissues of the scalp, vasodilatation of the external carotid circulation in individuals with a "predisposition" to vasomotor headaches,[1,9] and subdural adhesions.[6] Traction, displacement, and inflammation of cranial vascular structures may be another source of this symptom.[12] Cervical injuries have also been implicated.[8] It is apparent that "post-traumatic headache" is a blanket term covering a multiplicity of causes. The two cases described suggested to us that in some instances, probably rare, epilepsy may be a factor in the occurrence of this distressing clinical picture. Thus in trauma as in some idiopathic states, the areas of headache and seizures may overlap.

In considering the relationship of headache to idiopathic types of epilepsy, several qualifications must be taken into account.[5] Other causes of headache must be excluded; some feature in the history should suggest epilepsy (e.g. focal seizures, automatisms, etc.); and/or there must be EEG changes compatible with epilepsy. Finally, there must be successful response to anti-convulsant medication, preferably where analgesics and ergotamine preparations have failed. With respect to the two cases cited, obviously the first condition cannot be met . . i.e. if trauma per se is regarded as a possible cause of headache. However, the evaluation of both patients failed to disclose any objective lesion, such as subdural hematoma, subarachnoid bleeding, etc., as an etiologic agent of persistent headaches. Furthermore, both patients failed to respond to all conventional methods of headache management. In this and all other respects these patients fulfilled the criteria stated above. Most striking was the response in each case to anti-convulsant therapy.

The recurrence of symptoms in the one patient whose Dilantin was stopped also seemed significant.

Probably the commonest relationship of headache to epilepsy is as a prodrome, less so as an aura, and least as a true equivalent.[4] The headache in any of these instances is apt to be of a non-specific nature, most often diffuse. Since both the patients here presented eventually progressed to characteristic epileptic activity, it seems most likely that the headaches in these instances were prodromata, and that, as actually happened, the proper treatment would finally become apparent. It seems at least possible, however, that in some instances the headache following cranial trauma might be the sole manifestation of epileptiform activity, and that awareness of this possibility and the use of anticonvulsant medication might significantly shorten post-traumatic morbidity in such cases. Admittedly these occasions would in all likelihood be uncommon, but in the search for a solution to the elusive problem of headache after head injury, every possible helpful instrument must at times be employed.

It should be stressed that anti-convulsant medication should not be given routinely to patients with post-concussion headache, but only to those individuals with persistent or paroxysmal headache who on complete neurological evaluation (including, where indicated, contrast studies) show no evidence of other objective causes of cephalic pain, who have EEG abnormalities and/or other objective evidence suggestive of epilepsy, and who fail to respond to conventional therapy.

Summary

The acknowledged relationship of headache to epilepsy of the idiopathic variety is reviewed. The possibility of a causal connection between headache and epilepsy following trauma have been discussed, and two cases suggesting headache as a manifestation of some phase of the epileptic complex were presented. The criteria for suspecting such a relationship are outlined. Management of such cases is discussed briefly.

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> *The history of human error shows that the assertion "I am absolutely certain" or "I cannot help believing" in regard to any proposition is no adequate evidence as to its truth.*
>
> —M. R. Cohen and E. Nagel, *Introduction To Logic And The Scientific Method.*

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EDITORIALS

The Rest Dogma

For centuries rest was considered a cardinal principle of therapy. After all, what else did physicians have to offer to counteract infectious disease — the most commonly recognized illness. All treatment was empirical and directed towards relief of symptoms. Those illnesses in which fatigue was a cardinal symptom were treated symptomatically by rest. Persons with fever felt better at rest. When wounded or hurt, the part affected was kept at rest and perhaps the person also. Even wounded or hurt animals were observed to lie down or retreat to seclusion or walk off on three legs holding the hurt one at rest. It was only natural to carry over such empirical observations on the relief of symptoms to such diseases as anxiety neurosis, paralysis agitans, multiple sclerosis because such people complained of fatigue to their physicians. And many patients with rheumatic or arteriosclerotic heart disease also probably noted dyspnoeia and fatigue on slight activity. Thus became rooted the belief in our minds that rest is a great healer.

We are dogmatic when we take an attitude towards treatment or an idea which is devoid of all doubt. We are reluctant and unwilling to admit to ourselves that we may be wrong when we are dogmatic. Science is supposed to be free from dogmatism, and indeed this is so, but it is persons that are dogmatic and persons do not easily cast off peculiarities and traditions into which they have grown up. If the Rest Dogma were actually successful in the treatment of disease it would be easy to explain why the success generated a sense of confidence and infallibility. Unfortunately, as regards the rest cure, the reasons for the "success" achieved were not understood and we closed our eyes to the unfavorable observations, an attitude of mind which the philosophers call explaining away. There is another element in the dogmatic habit of mind and that is ignorance. Each of these three elements of dogmatism, success, explaining away, and ignorance have bedevilled the medical mind in the abuse of rest in the treatment of disease.

In the last century the name of Weir Mitchell became associated with an attempt to treat psychiatric illness particularly the psychoneuroses by a rest cure. The method became celebrated throughout the world and must have been successful or else it would not have had the vogue it did. Now we know that it was not rest itself which cured these people, if indeed they were cured, but rather the production of a profound physical enfeeblement resulting from prolonged rest which led Mitchell's patients to give up their neuroses. Sigmund Freud pointed out how easy it for a neurotic to give up his neurosis once an organic disease supervenes or a physical misfortune befalls him. The reason for the success of this treatment was not understood and it persisted as a fad long after it was shown that in general the rest cure was ineffective. As were the fads of bleeding and calomel purging which preceeded it, the vogue of rest persisted long after its scientific justification should have been recognized.

A generation ago patients with acute myocardial infarction were held at absolute bed rest for six weeks to two months. They were not allowed to move from one side of the bed to another, to lift a hand in self-help. Part of this practice rested upon the erroneous belief that the type of rest also rested the heart by reducing its cardial output. We now know that the cardiac output is actually less in the sitting position than in the prone position and this has given courage to the physicians to use armchair rest early in many cases of myocardial infarction. But part was also due to the fear that if we allowed the patient to move and should he die suddenly, that the doctor would be blamed for allowing the patient too much freedom. In fact, sudden death was more common then than now because phlebothrombosis of the extremities was facilitated by absolute prolonged rest and anticoagulants had not yet come into vogue to prevent this severe complication. Practices of this kind could not be attributed to success even in the sense in which it was experienced in the treatment of psychoneuroses, for no one dared to modify the rest treatment by a controlled study of rest and modified rest. It probably was followed dogmatically because of ignorance about the cardial output in upright and prone positions. Even though there was no scientific justification for the practice it was continued for a long time and we find it promoted occasionally even now.

Happily there is evidence that to prescribe inactivity for long periods of time can wreck even a normal person, as Asher showed in 1947.[1] The next year there appeared a superb study showing the deleterious effects of bed rest in normal persons and this very slowly led to appropriate changes in medical practice. Deitrick et al[2] immobilized normal volunteers in plaster of paris for six weeks and when they were allowed up at the end of this time they were wrecks of their former selves. Vasomotor instability and tremors were common among them. The blood pressure and other homeostatic mechanisms were impaired. A negative calcium and nitrogen balance resulted from severe catabolism. The recovery time from the treatment was long and some of the induced abnormalities required six weeks for correction.

If prolonged bed rest produced such disastrous effects on healthy persons what results can be expected by immobilizing the sick for lengthy periods of time. There is here no claim that brief rest is not necessary in a variety of disorders. But it is desirable to distinguish between the effects of the disease itself from those of treatment. In surgery and obstetrics there has been a wide swing away from prolonged rest after operation and delivery and we no longer see otherwise healthy men and women drop dead from pulmonary embolism as happened in the days of prolonged immobility.

In the management of patients with vascular disease of the extremities, Sir Thomas Lewis long ago stated that exercise to the point just short of causing claudication is the best guarantee that efficient collateral vascularization will form. In some clinics early ambulation of a patient with peripheral gangrene is being successfully pursued. Yet even today some physicians are placing a patient and his ailing extremity into a state of prolonged inactivity.

Some doctors appear to be hyper-cautious about permitting activity to the patient particularly after myocardial infarction. Aside from the appalling loss of potentially useful work to society, there is also the iatrogenic cardiac neurosis and frozen shoulder to contend with.

Frasher[3] et al have recently emphasized the generally excellent prognosis for ability to work following myocardial infarction when proper screening and safeguards are applied. And the same principles are profitable in guiding the return of self-cure during the early convalescent stage.[4] We all know the story of our former President who managed, after both a myocardial and a cerebral infarction to succeed in the most highly stressful job of all time.

The rest cure is still advocated in multiple sclerosis.[5] This type of conservatism brings back to mind the orthopedic practices a generation ago, in dealing with poliomyelitis. Many victims of this disease were cast in plaster for months. Not even massage much less vigorous exercise of the affected muscles were then countenanced. It required a Sister Kenny, who with numerous shortcomings, nevertheless, challenged the old ideas and brought massage, heat and activity back to treatment of poliomyelitis victims. Although vigorous resistive exercise treatment devised by Herman Kabat and in use since 1945 has not cured any of the diseases in which it was tried, such as poliomyelitis, multiple sclerosis, hemiplegia resulting from brain infarction or peripheral nerve disorder, nevertheless, it has demonstrably not injured a single patient and in fact has improved the loss of many.[6]

The "rest cure" of rheumatic fever has been attacked and progressive activity programs with this disorder are well established.[7] Even the rest cure in pulmonary tuberculosis has come under close scrutiny. Recently a publication has appeared advocating not merely exercise but even strenuous activity for the patient with active tuberculosis who is receiving chemotherapy.[8] 105 patients were treated by Weir et al with chemotherapy and active physical rehabilitation and the only complication reported to arise from this mode of treatment was two fractures which occurred in the rough and tumble. Are we here carrying the reactions to the rest dogma too far?

Thus the dogma of excessive rest has come full circle and is exposed for what it always was, namely a dogma based upon no experimental proof and perpetuated as all dogmas are by nothing else than belief. Its successes have been falsely interpreted, its failures not even explained away, and its perpetuations truly as a result of lack of knowledge and inertia against change. The enlightened physician who follows Doctor Paul D. White's advice and takes physical exercise himself will have a somewhat easier time with his reluctant patients to lead them into following the personal example.

L. H. N.

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Treatment Of Erythroblastosis Fetalis

One of the important medical advances of recent years has been our understanding of the pathogenesis and effective treatment of erythroblastosis fetalis. In a substantial number of infants serious brain damage or death has been prevented by exchange transfusion, using the exactly appropriate type of donor blood.

Not all affected infants receive prompt and proper care. The following situation is all too familiar in every hospital laboratory.

Horrible Example

At 2 A.M. the night technician is called to the nursery to draw blood from a sick jaundiced 6 hour old infant for blood count, microbilirubin, Coombs test, type and cross-match. About 1½ hours later he has completed enough studies to confirm to the physicians involved the presence of erythroblastosis and the need for transfusion. If he is lucky he has found a straight forward Rh_0 (D) incompatibility and an O Negative blood not over 5 days old in the refrigerator ready for cross-match. Elapsed time from birth to treatment — at least 9 hours. More often there is no blood fresh enough or the cause of the incompatibility is not clearcut. What a turmoil! Phone calls to the pathologist, the pediatrician, the Red Cross, the donors! And finally, many hours later, the baby is sicker, everyone's nerves are frayed, and the blood is ready.

Ideal Example

Baby Jones appears in the world. 10 minutes later the cord blood is in the laboratory for Coombs test to confirm the expected erythrocyte-antibody reaction. The previously arranged-for blood, less than 5 days old, is crossmatched with the mother's serum. Everything is ready for exchange transfusion whenever the pediatrician feels that it is indicated.

Achieving The Ideal

Under certain conditions it is impossible to avoid the "horrible examples." Most often this is due to lack of cooperation by the mother, who avoids medical attention until the time of delivery. Sometimes erythroblastosis is due to ABO incompatibility; this cannot be foretold but fortunately develops slowly in most infants. Under almost all other circumstances the following cooperative routine between patient, obstetrician, pediatrician and hospital pathologist will lead to ideal circumstances.

1. In the 6th month of each gestation (earlier if antibodies are known to be present) the patient's blood is examined. It is not safe to rely on the absence of antibodies in previous pregnancies; antibodies are rare in first pregnancies and occur more frequently with each successive gestation.

2. *The tests preferably are made in the laboratory of the hospital where delivery will be done.* Only in this way can further preparations for donor selection be carried out completely and unhurriedly.

3. The following studies are made
   A. Blood grouping (ABO)
   B. Blood typing (D)
   C. Serum screening for antibodies. This requires an antigen capable of reacting with all of the important antibodies (C, D, E. c, e, Kell, Duffy, Kidd, Lewis, P, S, M, N, Vel).

4. If any antibodies are found, accurate identification of each one is made. At appropriate intervals during pregnancy the titre is checked.

5. If antibodies are present, approximately 2 weeks before the expected date of delivery blood is drawn from the mother and rechecked for antibodies. At this time arrangements are made to have compatible blood less than five days old available at the time of delivery.

6. When the baby is born, if the clinical appearance and laboratory studies indicate the need for exchange transfusion, the compatible blood is already arranged for and is available when needed. Exchange is then carried out.

These recommendations are intended as a basic routine, and may require change in certain special instances.

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and
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Approved by Connecticut Society of Pathologists.

Mediaeval Arabic Physicians: Their Education And Practice

"What I most fear for you is a learned tongue and an ignorant heart."
— Muhammad

In the Golden Age of the Arabs from the ninth to the eleventh century, educational methods were in ferment. This was particularly true in medicine with the gathering of much new knowledge and the explosive growth of the hospital institution as it is known today.

A favorite method of training was the attachment of a youth to a physician as an apprentice. An example of this older style of teaching is in an account of a physician who paid his son a few dirhams a day to sit at the door of his house to bleed patients. The purpose of this was to "acquire a light touch" and some medical information at the same time. Hospital practice for them was not uncommon.

Other students confined their studies to the textbooks. Avicenna is said to have learned all from books. There is a tale that a young man was ordered by the Sultan to study medicine. He did this in Damascus by reading an introductory book by Hunain ibn Ishaq and also the Sections of Hippocrates. On the completion of his reading, he went to Cairo as a qualified physician. In this same period, ibn al-Quff read two books of Hunain, the great translator of the ninth century, the Sections of Hippocrates, and a clinical work by Rhazes.

Some students attended lectures in the hospitals. Records show that the hospital heads considered it their duty to deliver lectures on medicine to the physicians and students of the staff. One of the earlier and greatest physicians of this period, Yuhanna b. Masawaih, not only began his career as a drug compounder at Jundishapur but continued it for thirty years before he became famous in the medical profession. Some began as phlebotomists or in other kinds of menial hospital work.

It was not unusual in the mediaeval Arabic civilization for physicians to be authorities on other subjects as logic, geometry, music, and various branches of learning. What is little known in this connection is that the physician often could not earn a livelihood by his profession alone. As a result, some added to their earnings by playing the lute and singing, by teaching mathematics, Arabic law or medicine, and by teaching the Arabic language. One physician practised medicine and, at the same time, repaired clocks in use in the hospital. In fact, he received one overall salary for his varied work. The great Ali b. Ridwan of the eleventh century, until he was thirty two years of age, supported himself by being an astrologer and teacher in addition to practicing medicine.

No doubt, the spread of the new kind of institutional care for the sick was the most revolutionary contribution of early Arabic times to medical teaching. The germinal idea of the hospital as it is known today belonged to the Nestorians, a heretical Christian group which was expelled from Byzantium in the fifth century. They settled in Edessa, Persia, then later in Jundishapur of southwest Persia, in Nisibis, Mesopotamia, and in other cities of this region.

These exiles carried with them an intense love of learning and a passion for medicine. It is no accident that the Muslims with their deep respect for all knowledge asked the Nestorians for assistance in building their own hospitals and teaching staffs. Jundishapur contributed some of its greatest administrators and physicians to early Arabic hospitals.

The earliest hospital, or *maristan,* in Muslim times is believed to be that built by Caliph al-Walid I (705-715); the second was erected by al-Mansur, Caliph from 754 to 775. It was he who founded the city of Baghdad. Two of the great physicians attached to this hospital in the capacity of lecturing and practising were Bukhtyashu and Rhazes. To this so-called "Old Hospital," physicians came from all over the world to teach in its medical school and to carry on their practice. There were Christians, Jews, Persians, Indians, Greeks, and others in the employ of the court as physicians at the time. The hospital and its school were thus a meeting place of world medicine.

In the Arabic period, hospitals and their schools were the primary focal points for medical education in the large cities. In Damascus, for example, the Nuri Hospital was founded in the twelfth century. It is related that the chief of staff made daily rounds of the sick together with his pupils, wrote down prescriptions of medicine and therapy on the charts, visited his private patients, and then returned to the hospital lecture hall in the evening to discuss medical topics. The most famous Cairo Mansuri Hospital, founded in 1284 on the model of the Nuri Hospital, contained a pharmacy, dispensary, chapel, and library. A special lecture hall was available for the chief physician. The medical school of this hospital was famous all over Islam.

The hospital-school institution spread quickly over the Islamic world from western India to

Spain and Morocco. Physicians thus had the opportunity for extensive clinical practice; further practice offered itself in the mobile units. These were usually transported on beasts of burden to distant regions which required medical relief or suffered from epidemics. Prisons also had their visiting physicians.

To aid in the teaching process, the Arabs turned out many different kinds of medical textbooks for students and for further study by practitioners. There were many types of outlines and shortened versions of important larger books. To make much of the voluminous literature more readily available, tabellar treatises were developed. As the Arabic materia medica became more numerous, it became necessary in the thirteenth century to write brief accounts of the most commonly used drugs for hospital staffs. Artists were employed by medical schools to illustrate medicinal plants in books. An account is given of a physician who accompanied an artist to point out medicinal plants and their peculiarities so that the artist would draw them in all stages of their growth.

To be successful, an Arabic physician believed it essential to understand the patient better, both psychologically and otherwise, than the patient knew himself. The idea of training the whole man was not original with the Arabs but it was they who extended and polished this concept to a high degree of effectiveness. It is unfortunate that in our present day medical education is often incomplete in that the average practitioner is not as fully aware as were the mediaeval Arabs of this kind of therapy.

The ancient Arabic medical practice still exists to a large extent today in India in Yunani medicine which is based mainly on the *Canon of Medicine* of Avicenna and on the work of al-Masihi, his teacher. In the Yunani Medical College, in Hyderabad, India, the entire curriculum is based on Avicenna. He believed that the cardinal principle of medicine was that the entire man be treated. A thousand years ago this was a very important idea. Today it should be considered no less so.

Martin Levey, Ph.D.

Genetics And The Practice Of Medicine: A Case Of Neglect

The day is well past when genetics can be considered unimportant for the practice of medicine. It is now estimated that five per cent of the population carry two genes for diabetes. Ten per cent of American Negroes have an abnormal hemoglobin and an equal portion of Negroes males have red cells that are susceptible to hemolysis by certain drugs because of a genetically determined enzyme defect. One in two to three hundred persons is born with an extra chromosome, and the incidence is probably still higher among stillborn. Many congenital anomalies have a large genetic component. The total of the many less common inherited disorders makes up another significant group of diseases, and about one per cent of the population has hyperuricemia. Essential hypertension probably results from the effect of multiple genes (polygenic inheritance). Moreover, acquired abnormalities of the genetic apparatus of non-reproductive cells (somatic genetics) is a field of great importance. The chromosome number of most human solid tumors, for example, is abnormal, and disorders involving abnormal antibodies fall in this category. An understanding of basic genetic mechanisms is obviously essential for the physician to provide the best care for many patients.

On the one hand, genetics would seem to complicate medicine to an unreasonable degree. There are over 4,000,000 possible combinations of extra chromosomes (the great bulk of these will be lethal and never found) and the hemoglobinopathies which used to consist only of sickle cell anemia and thalassemia now include several dozen and potentially several thousand different disorders. On the other hand, an understanding of the individual abnormalities permits easy comprehension of the many combinations. A male patient with both an extra X and number 21 combines the abnormalities of Klinefelter's syndrome and mongolism, and a patient with SC hemoglobin similarly has clinical features of both hemoglobins. The common pathway from gene to protein serves as a unifying mechanism underlying both known and yet to be discovered genetic abnormalities. Perhaps the greatest contribution of biochemistry and genetics will be to provide a basis for an organized science of medicine

Yet the practitioners of medicine have little understanding of these relatively simple genetic mechanisms, and even the genetics of yesterday cannot be utilized until this is accomplished. Unfortunately, today's graduating medical students are also inadequately versed in genetics. The medical schools as well as the medical practitioners have been slow to realize the profound significance of the developments in genetics.

Much can be done in short order if sufficient interest is aroused. Postgraduate courses are being offered in increasing frequency. Most departments of Medicine and Pediatrics now have members with a major interest in genetic disease; special clinics for both diagnosis and counseling will follow from these. Enlargement of Connecticut's program in genetics is in order, and some provision for diagnostic procedures by the State will probably prove necessary for genetic diseases, as is now done with infectious diseases. The number of patients with genetic disease is so large, however, that they cannot be directly handled by those with a special interest in the field, and their role must primarily be that of educator and consultant. A disorder such as Klinefelter's Syndrome, for example, which occurs about once in 400 male births must be present in over 3000 of the male residents of Connecticut.

The level of general medical care can be significantly improved by utilizing the predictive power of genetics. The current statewide program of testing newborns for phenylketonuria is worthwhile, but, in general, it will remain most practical to examine the family members of patients in whom a genetic disease is diagnosed, rather than set up several hundred screening programs. Every physician must become sufficiently comfortable with the principles of genetics that he can at least pick out the family members who are at risk and see that appropriate examinations are carried out. Acceptance of this responsibility for individuals other than the presenting patient is one of the most needed changes in the thinking of the clinician. The public must also become better educated and more willing to cooperate with such examinations although most younger family members are already quite cooperative in this regard. Thus the surgeon must know that familial polyposis is dominantly inherited, and the pediatrician that phenylketonuria is inherited in an autosomal recessive fashion and proceed accordingly. Both of these disorders are treatable, but it is equally important to provide adequate genetic counseling for affected families where there is no present therapy.

There are two guiding principles of genetic counseling. Accurate diagnosis of the mode of inheritance must first be established. To accomplish this in some instances it is necssary to examine the family members, and the physician must grow out of his reluctance to do this. Muscular dystrophy, for example, can be inherited as an autosomal dominant or recessive, or sex-linked recessive disorder, and each is a different disease with a markedly different prognosis. Only by examining the family members can the three be distinguished with certainty since the clinical picture in the three may overlap. Not only does the family derive useful information but a much more accurate prognosis for the patient can be arrived at. The second principle is simply to impart to the family the best estimate of the probability of subsequent children being affected, and nature and severity of the illness. The decision on future childbearing is the family's, not the physician's. At present, this type of counseling should probably be undertaken only by physicians with special training in genetics, but of necessity will have to become one of everyone's medical abilities in the near future.

Coming decades will require an informed citizenry to assure that the potentially powerful tools of genetics are used in society's best interests. A genetically-sophisticated medical profession should be in the forefront of thinking about these problems. Already it is possible to alter the genetic constitution of bacteria in a predictable fashion and the new knowledge gained from the recent cracking of the nucleic acid code by Nirenburg and Ochoa and their colleagues, will inevitably lead to an increased ability to accomplish this in other organisms. It is, however, the prevailing opinion among geneticists that for the forseeable future our understanding of the consequences of altering the genetic composition of the population will be so limited that genetic knowledge should be utilized for adapting the environment to our genetic make-up (i.e., dietary management of galactosemia and phenylketonuria) rather than attempts to directly alter the genetic constitution of the population.

Reeducation in the principles of genetics must ultimately be the responsibility of every physician. Where to start? The *Outline of Human Genetics* by Penrose is a delightfully readable book which can be read and digested in two or three evenings. More complete discussions are available in Stern's *Human Genetics* and Clarke's *Genetics for the Clinician*. There is no satisfactory compendium of genetic disease, but *The Biochemical Basis of Inherited Disease* is an admirable reference for the metabolic disorders. The developments since 1959, when Penrose's book was published, in hemoglobinopathies, chromosome disorders and other rapidly changing fields, are reviewed in several volumes: *Progress in Medical Genetics, 1961 and 1962;* and *Recent Advances in Human Genetics.* McKusick and others publish a yearly review of articles in the field of human genetics in the Journal of Chronic Diseases, and the first three of these have been brought together in a single volume.

HERBERT A. LUBS, JR., M.D.

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Walking In Metchnikoff's Footsteps

When we think of man's total environment, we think of the external part, the earth, the air, the temperature, all living creatures including man himself. We think of the internal environment in which our cells live as they are bathed by the intercellular fluid. As though this were not complex enough, our attention has now been drawn to another portion of the total environment our intestinal flora whose control may turn out to have a profound effect on the well being of human infants and adults alike.

Over a half century ago, Metchnikoff asserted that most ofthe ills of old age arise from intestinal intoxication and that the lactobacillus plays a useful role in man and animals by antagonizing the noxious components of the intestinal flora. This idea occurred to him because he saw the vigor and longevity of the Bulgarian peasant and he believed that this was due to their ingesting large amounts of lactobacilli in the form of sour milk. This imaginative idea, never put to the experimented test, finally became of interest only to a few historians, pediatricians, and not so few health cranks and manufacturers of yogurt and acidophilus milk.

Recently, however, in defense of Metchnikoff's idea, there have come to light observations in the field of animal husbandry, and now a report by Dubos and Schaedler[1] of four years experience with a colony of mice (N.C.S.) which were brought up so that the largest percentage of their fecal population was composed of lactobacilli especially the rhizoid type. The N.C.S. colony was built up from nine young obtained by Caesarean section from three Swiss females and fed by selected foster mothers. The mothers and foster mothers were treated and selected in such a manner as to eliminate microbial diseases from them as completely as possible. The N.C.S. rats were fed D & G pellets so that their stools yielded large numbers of lactobacilli, whereas the control groups showed markedly different intestinal flora in that, in addition to some lactobacilli, they also contained enterococci, coliform bacilli many of which were lactose fermenters, and smaller numbers of Pseudomas and Proteus. The colonies of N.C.S. mice, rich in lactobacilli in the feces showed profound biological differences from the control group. They had a lower infant mortality, a more rapid weight gain. They thrived on glutin diets deficient in lysine, threonine and valine, and they showed resistance to endotoxins, cortisone and total body radiation.

Dubos and Schaedler also discovered that even when the N.C.S. mice were exposed to various bacterial species, their fecal flora remained predominately lactobacilli with no Proteus, Pseudomonas or lactose fermenters, provided they were kept on their special diets with the D & G pellets. However, any alterations in the fecal flora caused by changing the diet in the N.C.S. mice, or feeding them antibacterial drugs which destroyed the lactobacillus, and subjecting them to physiological stress, caused the mice to become like the control group, more exacting nutritionally, more susceptible to the lethal effects of endotoxin and less resistent to experimental infections. The experimental results lend support to the hypothesis that the intestinal flora may be of special importance in determining some of the physiological characteristics of animals.

The authors are aware of the difficulties inherent in the interpretation of their results, particularly that of drawing precise causal relationships between presence and abundance of lactobacilli to the physiological characteristics of these animals, particularly their resistance to infection. They are aware that the phenomena they have described may be an expression of a common cause rather than being dependent on each other. But regardless of differences in interpretation, it is clear nevertheless that "normal indigenous flora becomes established in the body under a given set of conditions. What is normal under one set of conditions is not necessarily normal under another. Most importantly the flora can be changed away from one with noxious influences to one with salutary effects."

For a long time we have been laboring under a belief that differences in animals in their response to infection must be sought for in their genetic endowment. Here we have indisputable evidence that in the world of mice the indigenous flora is responsible at least in some part for a number of physiological and immunological traits both favorable and unfavorable which are commonly assumed to have a genetic basis.

There is no evidence that swallowing lactobacilli will endow a person with the vigor and longevity which the Bulgarian peasants are said to enjoy. "Walking in Metchnikoff's footsteps once more, we are inclined to believe that the usual intestinal flora is an expression of man's total environment and that its control may turn out to have as profound an effect on the well being of human infants and adults as it has on the growth of mice and of farm animals." With these words Dubos and Schaedler have called serious attention to another dimension in man's total environment, the nature of his intestinal flora.

L. H. N.

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THE PRESIDENT'S PAGE

FIFTEEN years ago when socialized medicine was threatening to disrupt American medicine the Connecticut State Medical Society joined hands with a group of organized public-spirited citizens known as the Connecticut Medical Service with a single purpose to ease the burden of illness for the people who had a limitation of dollars. The avowed purpose was to care for those people who were not only medically indigent but for those of a low income group. It was more or less taken for granted that about one half of the people in our state would be included in this effort. Both the CSMS and the CMS have wasted much time in attempting to define this 50-50 line which separated those people who deserved medical financial consideration from those who could pay medical bills. In fact the line was always evasive and never has been disclosed.

During the past decade and half, times changed, families changed, standards changed, and the value of the dollar changed. Differences of opinion rose to some heights concerning service benefits which produced ill-feelings between the two parties such as to reflect an embarrassment to both parties and to the people for whom the whole project was devised. It would seem that the focus of vision on the original purpose had been deflected. The physicians who participated in the program accepted the plan to care for the medical indigent and low income group on a sub-standard payment basis and it was expected that the CMS would negotiate a plan or plans on a prepayment system such that the CMS would remain a non-profit organization.

Now we are living in a different socio-economic period. We have learned that 85 per cent of the elderly people are capable of caring for their illnesses in one way or another. Old peoples' homes, old age pensions, social security, relief pay, insurance companies, and numerous other agencies cause a change in the scope in the care for the poor which was not provided fifteen years ago. The medically indigent remains the same urgent problem although not as great in quantum. Salaries have risen so that the prepayment plan can be more readily applied to the 4,000 to 6,000 and 7,500 or 8,000 dollar income level groups. It must be stressed that the so-called service benefit contracts contain a voluntary service benefit factor which is a sacrifice on the part of the doctors and that they should have a voice in the construction of the service benefit contracts.

Both the CSMS and CMS organizations are composed of men of education, ability, experience, and competency. The time has arrived when all personal ill feelings of the past should be discarded and both organizations focus anew on the original purpose to jointly give care to the poor and low income groups in a unified, dignified, and dedicated manner. If this unity of purpose cannot be made a non-personal joint effort, time, physical changes, economic shifts or the government will absolve both parties.

The future for both the CSMS and the CMS depends on how thoroughly can the joint effort of the care of the poor people be brought into harmony. The liaison committee representative of both organizations can convert differences into dignified resolutions. To lessen the opportunities for differences to develop, plans should be expanded to include all physicians as participants in the care of the medically indigent and low income groups. This is not socialized medicine but medicare under physicians' plans.

CLYDE L. DEMING, M.D.

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William R. Richards, m.d., *General Manager*

James G. Burch
Director of Public Relations

160 St. Ronan Street, New Haven, Conn.
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Josephine P. Lindquist
Assistant to General Manager

CALL

ANNUAL MEETING OF THE HOUSE OF DELEGATES

The 1963 Annual Meeting of the House of Delegates will be held at the Statler-Hilton Hotel, Hartford, commencing at 10:00 o'clock in the morning of Tuesday, April 30.

Following luncheon, the House will reconvene for the completion of business.

Clyde L. Deming, President
Michael R. Scully, Speaker of the House
Orvan W. Hess, Secretary

INTRODUCTION OF RESOLUTIONS

Article V, Section 12, Par. 3 of the Bylaws of the Society provides that:

All resolutions to be considered as regular business at any regular meeting of the House of Delegates must be in the hands of the Speaker not later than seventy-two hours before the opening of that meeting. All resolutions and recommendations published in the official agenda distributed to the members of the House prior to the meeting at which action is to be taken shall be considered as regular business. Resolutions presented later than seventy-two hours before the opening of a meeting will be referred for consideration as regular business by the House only when they are presented by the Council or accepted for consideration by majority vote of the delegates present. Any resolution which does not qualify in accordance with the aforesaid provisions for consideration as regular business may be accepted for action by a majority vote of the delegates present and, if so accepted. shall be referred at once by the Speaker to a reference committee. Any such reference committee shall consider resolutions referred to it and shall report, with recommendations, to the House before adjournment of the meeting.

Delegates To Annual Meeting

The Bylaws of the Society provide that each county association is entitled to one delegate in the House of Delegates for each thirty-five Active or Life members in the association or fraction thereof based on the membership as of December 31st of the immediately preceding year. According to this, the quota of delegates from each county association who should attend the Annual Meeting of the House of Delegates which will be held in Hartford, April 30, 1963 and the Semi-Annual Meeting in December, 1963 is as follows:

County	Membership Dec. 31, 1962	Official Delegates
Fairfield	905	26
Hartford	1047	30
Litchfield	135	4
Middlesex	120	4
New Haven	940	27
New London	189	6
Tolland	22	1
Windham	65	2

Election Of Councilors And Associate Councilors

Councilors and Associate Councilors, who shall serve for two years, shall be elected this year at the annual meeting of each of the county associations in Hartford, Middlesex, New London and Windham counties. In accordance with the Bylaws, each component association having 750 members may elect one additional Associate Councilor. Therefore, the Hartford County Medical Association should elect a Councilor and two Associate Councilors each for a two year term.

No Councilor or Associate Councilor elected by a component association shall serve more than three successive terms of two years each in his respective office, but after a lapse of one term of two years, such Councilor or Associate Councilor shall be eligible for reelection.

Newly elected Councilors and Associate Councilors shall not assume office until after the Annual Meeting of the House of Delegates.

At the Semi-Annual Meeting of the House of Delegates on December 4, 1962, Article VII, Section 2 of the Bylaws of the Society was amended by the addition of the following sentence after the term Councilor-at-Large: "In the event that both the Councilor and the Associate Councilor (s) from a county association cannot be present, the President of the county association may appoint a substitute councilor."

COUNCIL MEETINGS

FOREWORD

At the Council meeting of January 24, 1963, it was VOTED that hereafter detailed minutes of the Council's proceedings shall not be published in *Connecticut Medicine* but that the General Manager "shall prepare considered, pertinent summaries of the actions taken by the Council at its meetings and submit these for publication in *Connecticut Medicine,* such summaries to be given prior approval by the Chairman of the Council." It was further VOTED that "copies of the detailed minutes of each Council meeting shall be mailed to all members of the CSMS House of Delegates."

The primary reason for this action of the Council is that making public property of the detailed minutes often enables individuals and agencies outside the Society to gain prior knowledge (often without adequate understanding of the matters concerned) of plans being made by the Council to study and attempt to deal effectively with problems which are of the greatest importance to the medical profession, and that this knowledge is sometimes used by those individuals and agencies to the detriment of the practitioners of the State and of the Society itself.

SUMMARY OF ACTIONS

January 24, 1963

I. ATTENDANCE

Present were: Dr. Gilman, Chairman, and Drs. Deming, Pitock, Goldberg, Hess, Weise, Sr., Gardner, Wilson, O'Connor, Bradley, Cornwell, Grendon, Grant, Davis, Murray, Jr., Hughes, Dean, Weber, White, Egan, Abbot, Caplan, Phillips, Hastings, Beardsley. Also present: Mrs. Lindquist and Dr. Richards. Absent were: Drs. Cullen, Martin, Scully, Chartier and Gevalt.

II. ROUTINE BUSINESS

LIFE MEMBERSHIP. It was VOTED to approve applications for Life Membership for eligible Active Members as follows: Marion G. Mouradian, New Britain; John W. Larrabee, West Hartford; Theodore R. Dayton, West Redding; Samuel J. Chernaik, New Britain; Edward A. Coppola, Waterford; Virginia A. Hale, Sarasota, Fla.; Augustus R. Felty, Old Saybrook; Raoul J. Benoit, Clearwater, Fla.; Benedict B. Landry, West Hartford; John F. McDermott, West Hartford; William E. Carroll, E. Orange, New Jersey.

The General Manager outlined certain administrative problems which have arisen and probably will continue to arise concerning the approval of applications for Life Membership, such problems stemming from the provisions of the newly-effective Bylaws that August 1st is the cut-off date for the payment of annual dues and that a physician becomes eligible to apply upon reaching "his sixty-fifth birthday anniversary." Since the Bylaws appear to mean the anniversary of the *day* of birth rather than only the *year* of birth, unnecessary collection and remitting of dues is likely to occur for those members whose actual birthday falls after August 1st, the final day for payment of dues. In consideration of this information, it was VOTED to request the Subcommittee to Study and Revise the Bylaws for a ruling on the question of "day vs. year" of birth being the intent of the Bylaws, and to submit an opinion on this question to the next meeting of the Council.

COMMITTEE ON PUBLIC HEALTH. a) Resignation: It was VOTED to accept the resignation of Alan C. Mermann, Guilford, as a member of the Committee, and it was further VOTED to appoint Joseph J. Bellizzi, Hartford, to replace Dr. Mermann on the Committee during the remainder of his unexpired 1962-63 term.

ANNUAL DUES—CONFERENCE OF PRESIDENTS. It was VOTED to authorize payment of annual dues, in the amount of $75.00, to the Conference of Presidents and Other Officers of State Medical Associations.

RESIGNATIONS—COMMITTEES ON AGING AND MEDICARE PLAN. It was VOTED to accept the resignations of Edwin F. Trautman, Trumbull, from membership on the Committee on Aging and on the Advisory Committee on Medicare Plan. It was further VOTED to appoint Alexander J. Tutles, Hartford, to complete Dr. Trautman's unexpired term as a member of the Committee on Aging.

EXEMPTION FROM DUES. It was VOTED to exempt J. Clement Griffin, Plainfield, from payment of CSMS dues for 1962 (retroactively) and for such additional years as he may be engaged in pursuing a course of postgraduate education.

COMMITTEE ON EMERGENCY MEDICAL SERVICE. It was VOTED to authorize the attendance of John Shoukimas, Hartford, Chairman of the Committee, at an AMA Conference on Disaster Care in Atlanta, Georgia, and to reimburse Dr. Shoukimas for usual expenses incurred as a result of his attendance.

INTERIM APPOINTMENTS. Reviewing various posts left vacant by the death of Vincent A. Gorman, Bridgeport, is was VOTED to act as follows:

Alternate Delegate to the AMA—Refer to 1963 Committee on Preliminary Study of Nominations.

Panel on Physician-Hospital Mediation—Appoint Frederick C. Weber Jr., Greenwich, to replace Dr. Gorman for remainder of unexpired 1962-63 term.

STUDENT MEMBER. It was VOTED to elect to Student Membership—William T. Richardson, Greenwich, attending the Albany Medical School—Class of 1966.

COMMITTEE ON MEDICAL EDUCATION AND LICENSURE. It was VOTED to authorize the attendance of C. Louis Fincke, Stamford, at the Congress On Medical Education and Licensure to be held in Chicago on February 2-5, 1963, and to reimburse Dr. Fincke for incurred expenses up to the amount of $225.00. Dr. Fincke is asked to file a report on the Congress with the Council.

CONFERENCE COMMITTEE WITH THE CONNECTICUT BAR ASSOCIATION. It was VOTED to authorize the Conference Committee to spend up to the amount of $325.00 as the Society's share of financing a medico-legal symposium to be put on jointly by CSMS and the Connecticut Bar Association at Waverly Inn, Cheshire, on March 18, 1963.

SUBCOMMITTEE ON OPINION SURVEY REPORT. It was VOTED to accept the report of the Subcommittee that its work is completed and its recommendation that the Subcommittee be discharged. It was further VOTED that the Subcommittee be discharged with thanks for a job well done.

DATE OF NEXT MEETING. The date of the next meeting was set for Wednesday, February 20, 1963.

III. Old, New And Special Business

CONNECTICUT CHAPTER OF THE AAGP. Having reviewed pertinent correspondence between D. Norman Markley, Past President of the CCAAGP, the Commissioner of Health and the Chairman of the Council concerning the Health Department's Conference on Hospital Licensing, June 14, 1962, it was VOTED to direct the Chairman to inform Dr. Markley and the Board of Trustees of the CCAAGP that the Council has received and discussed the communications transmitted to the Chairman by Dr. Markley, and reaffirms its intention to represent impartially and cooperate with all members of the Connecticut State Medical Society in any way or ways which will be in the best interests of Medicine in Connecticut.

LEGAL RESPONSIBILITY OF PHYSICIAN. In response to a request from Hyman A. Levin, Clerk of the New Haven County Medical Association, that the question be explored as to the legal responsibility of the surgeon for all aspects of care rendered to a hospitalized patient and the extent thereof, it was VOTED to appoint Jacques H. Green, North Haven, a committee of one to investigate this matter through the Legal Department of the American Medical Association.

AD HOC COMMITTEE ON MEDICAL RESEARCH. It was VOTED to approve a series of recommendations of the Ad Hoc Committee as follows:

1. That the Legislative Committee exercise its influence as strongly as possible upon the Legislators.

2. That the pages of Connecticut Medicine be utilized, especially by the senior officers of the Society, to urge physicians to back the Bill.

3. That official representatives of the Medical Society at the highest level, seek a meeting with the Governor to explain to him the advantageous aspects of the Bill.

4. That the Council urge the County and City medical societies 1) to prepare strong official resolutions in favor of the Humane Research Bill at the earliest possible date, 2) to appoint official representatives to speak directly and personally with the Representatives and Senators from their districts.

ADVISORY COMMITTEE ON NUTRITION. In response to a request from Max Caplan, Chairman of the Committee, concerning the advisability of providing *The Hartford Courant* with stereotyped diets for weight control (bearing the endorsement of CSMS), it was VOTED to inform Dr. Caplan that the Council shares his concern regarding certain aspects of the proposal and recommends that the Advisory Committee *not* provide *The Courant* with "Society-approved" diets but offer instead to provide the publication with information and articles on the subject of nutrition.

COMMITTEE ON PUBLIC HEALTH. It was VOTED to approve the following recommendation of the Committee re routine immunization:

"The Committee reaffirms its action taken on September 13, 1962, concerning the routine immunization program and it recommends that the presidents of the medical staffs of Connecticut hospitals be reminded that the immunization programs for medical staff and hospital employees should be brought up to date."

CIGARETTE ADVERTISING IN CONNECTICUT MEDICINE. Having reviewed correspondence between Gioacchino S. Parrella, Milford, The Editor of *Connecticut Medicine* and the Council concerning the acceptance of cigarette advertising in the Journal, it was VOTED to table action on Dr. Parrella's question: "Is it proper for a medical journal to accept cigarette advertisements?"

THE CORPORATE PRACTICE OF MEDICINE. The Council was informed in written communications, that the County Medical Associations of Windham and Tolland had voted to approve the Council's intent to take effective action in the matter of the corporate practice of medicine. Verbal reports of Council members present indicated that Lichfield and New London County Associations had taken a similar action.

REPORT—COMMITTEE ON HOSPITALS. It was VOTED to accept the report and recommendations of the Committee on Hospitals concerning improved liaison between hospital medical staffs and boards of trustees, as follows:

1. Each hospital should have an *effective* Joint Conference Committee (Liaison Committee) the physician members of which should be popularly elected by the Medical Staff and not necessarily only those who excel professionally.

2. An elected representative of the Medical Staff of the Joint Conference Committee (Liaison Committee) should be permitted to attend meetings of the Board of Trustees of a hospital to simplify communications.

3. Special committees of the Medical Staff should include representatives of management as indicated, as well as special management committees including medical staff representatives.

4. The "Executive Committee" of the Medical Staff should include the administrator in its sessions.

CONNECTICUT MEDICAL SERVICE, INC. Held over from the last meeting, nominations were made and voted on by secret ballot for four physician CMS Directorships as follows:

Nominees recommended to CMS (1963-65)
Max Caplan, Meriden
Howard K. Ente, Westport
Cleveland R. Denton, Hartford
William J. Murray, Jr., New London

N. B.: *The foregoing is a summary of the proceedings and actions of the Council on January 24, 1963. Detailed minutes of the meeting are on file at 160 St. Ronan Street, New Haven, for perusal by any interested member of the Society.*

PLACEMENT WANTED

The Society's Placement Service is in receipt of the following: Harvey I. Wolfe, Age 32 — M.D. N.Y. State Medical, Syracuse, N.Y., 1956. Specialty Allergy. Available July 1963.

Joel J. Baron, Age 30—M.D. Northwestern Univ. Medical School. Specialty Obstetrics and Gynecology. Available July 1963.

John C. Going, Jr., Age 31 — M. D. Tufts 1956 — Specialty Obstetrics and Gynecology. Available July 1963.

Obstetrician — Gynecologist — Age 34, board eligible. Available July 1963.

Internist — Age 29, would like group type practice or full time hospital position. Available June 30, 1963.

Physician specializing in Internal Medicine — M.D. Stanford Medical School 1958, interested in group practice with sub-specialty in chest diseases.

PLACEMENT OPPORTUNITIES

Medical Education Director wanted for 190-bed hospital. Other professional activity within the hospital essential. Board certified pathologist or cardiologist preferred. Salary open. Reply to Secretary of Medical Education Committee, Mount Sinai Hospital, 500 Blue Hills Avenue, Hartford 12, Conn.

Part time Director of Medical Education wanted in 300-bed community hospital.

Wanted well trained American physician to work with Dr. Gordon S. Seagrave at his hospital in Namkham, Burma.

ANYONE INTERESTED IN THE ABOVE IS ASKED TO COMMUNICATE WITH THE GENERAL MANAGER'S OFFICE, 160 ST. RONAN STREET, NEW HAVEN.

1963 MEETINGS

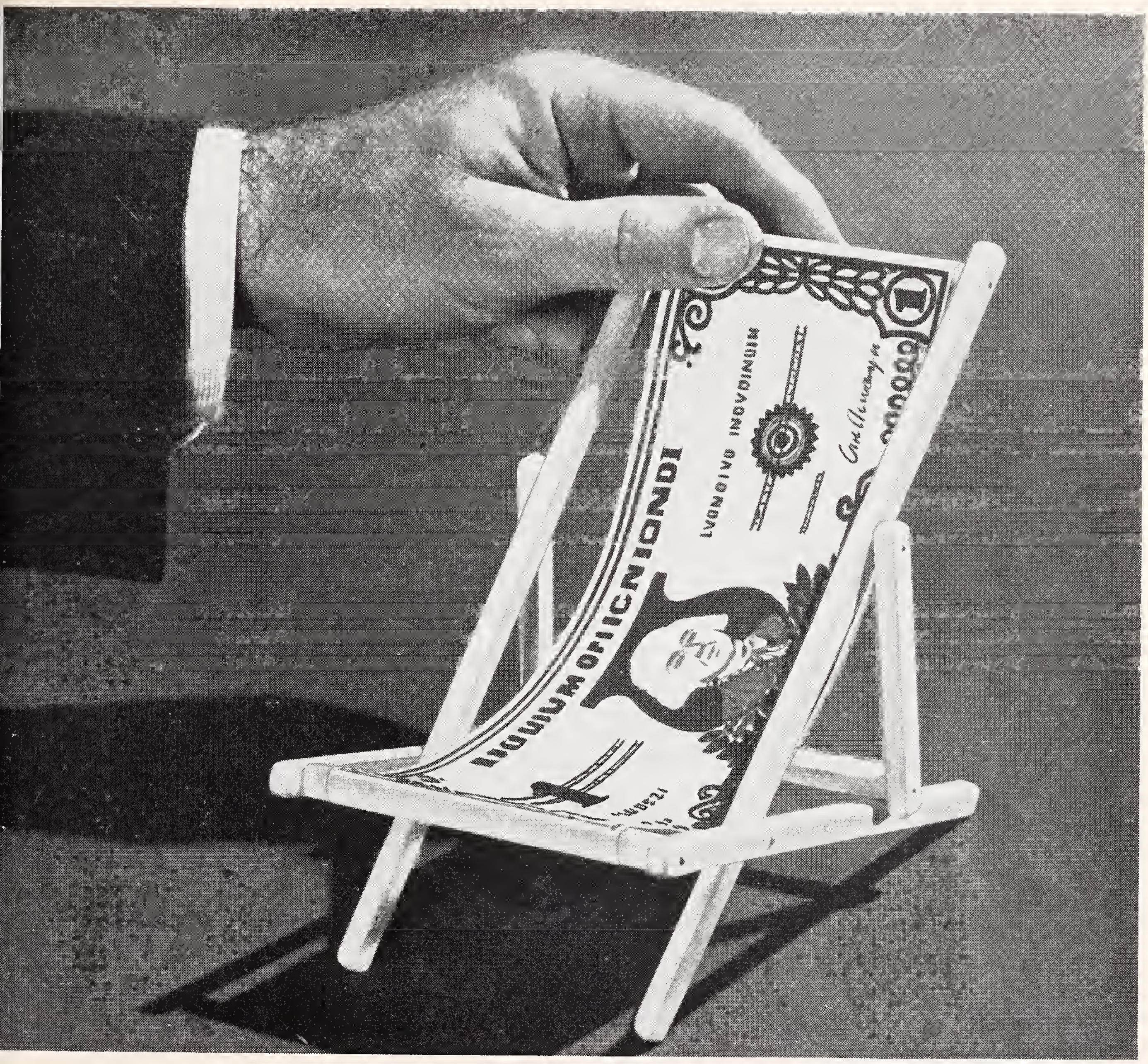
March 28—179th Annual Meeting, New Haven County Medical Association. Business Meeting is tentatively scheduled for 2:30 P. M. at Waverly Inn, Cheshire.

April 30-May 1-2—171st Annual Meeting, Connecticut State Medical Society, Statler-Hilton Hotel, Hartford.

May 15—Third Symposium on Graduate and Postgraduate Medical Education in the Community Hospitals to be held at the Yale-New Haven Medical Center, 1:30-5:30 P.M. Sponsored by the Connecticut State Medical Society, Connecticut Hospital Association and Yale School of Medicine.

June 16-20 — American Medical Association, Annual Meeting to be held in Atlantic City.

September 27—38th Connecticut Clinical Congress to be held at the Yale-New Haven Medical Center.



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Clinical Pathological Conference

YALE UNIVERSITY SCHOOL OF MEDICINE

SEPTEMBER 27, 1961

Discussant:
Arthur J. Geiger
Clinical Professor of Medicine

Pathologist:
Milton R. Hales
Associate Professor of Pathology

PRESENTATION OF CASE

First Admission

This 64 year old retired factory worker was first admitted to the New Haven Hospital on February 11, 1956 with the chief complaint of cough and chest pain of one week's duration. He had reportedly been well and working until February 4, 1956, when he experienced anterior chest pain described as burning in nature, accompanied by a pressure sensation, radiating through to the back, and associated with pains in both arms and legs. The pain persisted intermittently thereafter, and during the subsequent week, the patient noted increasing shortness of breath and a dry non-productive cough. He continued at work, however, until the day before admission when he sought medical attention and was advised to enter the hospital. He stated that he had had similar "chest colds" several times in the previous few winters, but denied any previous chest pain, orthopnea, chronic cough or ankle edema. He also denied any knowledge of hypertension, tuberculosis or pneumonia. His only previous visit to the hospital was in 1955 for repair of a skin laceration. His blood pressure at that time was 150/90 and physical examination was unremarkable. On physical examination the temperature was 101°, pluse 94, respirations 24, and blood pressure 140/80. He appeared well developed, somewhat obese, and in moderate respiratory distress. The skin was warm and moist. Minimal arteriosclerotic changes were noted in the retinal vessels. There was a mucopurulent discharge in the nasopharynx, and the pharynx was described as moderately injected. The chest was increased in anterior-posterior diameter with a large abdominal component to the breathing. At both lung bases the breath sounds were depressed and there were moist inspiratory rales. The heart size could not be determined, and the heart sounds were very faint. No murmurs or friction rubs could be heard. There was no clubbing of the digits, no cyanosis, but 3 plus pitting pretibial edema was present. Physical examination was otherwise unremarkable.

Course In Hospital

During the first week in the hospital, the patient's condition steadily improved on complete bedrest, oxygen, digitalis, and sedation. The basal rales almost completely disappeared as did the ankle edema. The temperature fell gradually to normal, and there was no pain in the chest, arms or legs after the first 24 hours. On the 7th day, the heart sounds were heard more distinctly, and a soft apical systolic murmur was described. On the following day, the patient again complained of anterior chest pain, and now a loud pericardial friction rub was audible. The chest pain persisted for three days, during which time Dicumarol therapy was started. The course was again uneventful for the next two weeks, but on March 5, 1956 he again complained of chest pain; the cough recurred and was productive of white sputum; the temperature rose to 104°. Antibiotics were given, and after three days, the temperature was again normal. There was not subsequent recurrence of the chest pain or fever, and he was discharged on March 22, 1956, 5½ weeks after admission.

Laboratory Data

Hb 12.0-12.5. WBC. February 12, 1956, 12,000 (69 per cent pmn); March 5, 1956, 6,900 (83 per cent pmn). Urine, unremarkable. Serum electrolytes, sugar and NPN, all normal. First strength PPD 3 plus.

X-rays

February 13, 1956: Cardiac enlargement, pulmonary congestion and small pleural effusion.

March 5, 1956 (portable): Homogeneous haze overlying the left lung field, probably fluid.

March 14, 1956: Decrease in size of heart since admission film, slight blunting of costrophrenic angle; no gross evidence of pneumonitis. Uppei and lower G-I series, unremarkable except for nonfunctioning gallbladder with cholelithiasis.

Electrocardiograms

(February 11, 1956) Rate 115, PR 0.20, regular sinus rhythm, QRS 0.06 with diminished amplitude, axis normal, RST elevated in 2, 3, VF, V6; shallow inversion of T waves in 3 and V5.

(2/13/56) Rate 94, rhythm totally irregular, T more deeply inverted in V4, V5, V6.

(2/17/56) T still more deeply inverted in V3, and persistently inverted in V3, and persistently inverted in V4 and V5; regular sinus rhythm.

(2/20/56) "Compared with admission ECG there is inversion of T in V2, V3, V4".

(3/1/56) "Further inversion of T in 1, 2, VF, V4, V5, V6."

(3/2/56) Auricular flutter with 4:1 block; totally irregular rhythm of auricular fibrillation in CV leads.

(3/12/56) "Compared with 2/20/56 there is now greater inversion of T in 1, 2, VL, VF, V2, V3, V4, V5, V6; PR prolonged to 0.24 seconds."

Interval History

By May, 1956, signs of congestive heart failure had recurred, and in spite of digitalis, salt restriction, and vigorous diuretic therapy, this persisted and increased in severity during the next 15 months until his final admission. He experienced no further chest pain, but manifested 3 to 4 plus pitting edema of the legs, edema of the penis and scrotum, and signs of pleural effusions. In spite of this, he was dyspneic only on exertion, and orthopnea was only of mild degree. Moist rales were always audible at the lung bases; the neck veins were distended, and there was evidence of hepatomegaly and cardiomegaly. The heart sounds were always described as "faint." Blood pressure ranged around 100-120 ststolic, and 65-80 diastolic; the pulse was 80-100. Venous pressure ranged around 230 mm. saline, and the circulation time 40-50 seconds. Serum electrolytes and NPN remained normal. After December, 1956, liver function tests revealed some abnormalities; the total serum bilirubin was 1.98-3.50 (direct 0.98-1.41), cephalin-chol. flocculation 0/1-3 plus, thymol turbidity 0.8-1.2, thymol flocculation 0, alkaline phosphatase 16-18 B.U., serum albumin 3.21, serum globulin 3.60. X-rays revealed persistent pleural effusions, in addition to cardiac enlargement. Kymography failed to demonstrate any abnormality in the pulsations of the left cardiac border; the right border was obscured by the pleural effusion. Electrocardiogram in December, 1956, revealed a rate of 100, regular sinus rhythm with first degree A-V block, PR interval 0.22, abnormally low QRS in all leads and abnormally low T in 1, 2, V4-6. In May, 1957, the rhythm was that of auricular fibrillation; the low amplitude persisted; RS-T was abnormally depressed in V4-6, and T abnormally diphasic and inverted in 2 and V3-6. Because of the intractable congestive failure, the patient was admitted to the hospital for the 5th and last time on August 14, 1957.

Final Admission

August 14, 1957. Physical examination revealed a blood pressure of 100/70, pulse 50 (irregular), respirations 32, and temperature normal. The patient was described as a thin old man with moderate respiratory distress. The neck veins were distended at 90°. There were signs of pleural effusions bilaterally. The left border of cardiac dullness was at the anterior axillary line; the heart sounds could not be heard. The liver margin was 4 cm. below the costal margin. There was no evidence of ascites. There was marked edema up to the level of the umbilicus. Venous pressure was 270 mm. saline, the decholin circulation time 35 seconds. Chest x-rays revealed bilateral pleural effusions which obscured the heart size. Hematocrit, leukocyte count, serum electolytes, NPN, fasting blood sugar were all normal. Liver function tests were still abnormal but not significantly changed from December, 1956, except for a serum albumin of 1.5 and serum globulin of 3.6 gm. per cent. Several thoracenteses were performed, yielding clear yellow fluid with a specific gravity of 1.008-1.012, with an unremarkable sediment, and with no growth on culture. Electrocardiogram on admission was essentially unchanged from that of May, 1956, except for a 3rd degree block now present. Under vigorous diuretic therapy, the edema appeared to be decreasing and the pleural effusions reaccumulating less rapidly until August 22, 1957, when there occurred an episode of shock, acute respirtory distress, and cyanosis, with loud inspiratory and expiratory wheezes throughout the lung fields. There was no pain. Electrocardiogram now revealed a partial A-V block with Wenckebach phenomenon, and with "more abnormal ST and T changes suggestive of digitalis effect and left ventricular hypertrophy." This attack was successfully treated with morphine, oxygen, aminophyllin and tourniquets, but during the following 48 hours, the patient became increasingly cyanotic; the blood pressure gradually fell to shock levels and he expired on August 24, 1957. Electrocardiograms on August 23, 1957, and August 24, 1957, were unchanged from that of August 22, 1957.

DIFFERENTIAL DIAGNOSIS

Dr. Geiger

This 64 year old retired laborer had been well until February 4, 1956, when he suffered anterior chest pain of burning and pressing character with radiation to the back to both arms and, it is stated, to the legs. Because of this alleged radiation to the legs one is led to give at least passing consideration to an extensive dissecting aneurysm of the aorta. There are, however, several reasons why the diagnosis of such an extensive dissection is untenable; The patient "continued to work" for a week, and from the description of the case we can confidently rule out the usual antecedents of dissecting aneurysm, such as hypertension, coarctation of the aorta, Marfan's syndrome, and Erdheim's cystic medial necrosis of the aorta in which aortic widening and valvular insufficiency are prominent. I feel justified in discardng the symptom of radation of pain to the legs as an error in the history.

Increasing dyspnea and dry cough and, we note later, deep edema of the legs developed *during* the week of intermittent chest pains prior to the patient's consulting a physician, who admitted him to the hospital.

The presenting symptoms in this setting would most commonly be encountered in acute myocardial infarction followed by congestive failure of the heart in a man who had continued physically active; less often the symptoms would represent acute pulmonary embolism, with the edema reflecting either congestive failure or venous obstruction from thrombophlebitis; and even less commonly the symptoms might represent acute pericarditis with an effusion sufficiently large to produce dyspnea and cough; the leg edema in this case would imply right ventricular failure or systemic venous stasis induced by the impedment to the venous return to the heart. However, the normal blood pressure and pulse pressure, absence of significant tachycardia and the continuation of pericardial pain for days beyond the development of the edema argue against, but do not exclude, the presence of a pericardial effusion sufficiently large to cause cardiac tamponade.

That acute pulmonary embolism was almost certainly not the initiating illness is implied by the radiation of the pain to the arms, since such radiation rarely, if ever, occurs with pulmonary embolism. Moreover, neither the intial ECGs nor chest x-rays showed pulmonary embolism or infarction, but one must admit that such evidence is often lacking.

My diagnosis from the history is probable acute myocardial infarction, and the ECGs of February 11 suggest a posterior area of injury, while the ECGs of February 13 suggest anterior ischemia and show atrial fibrillation.

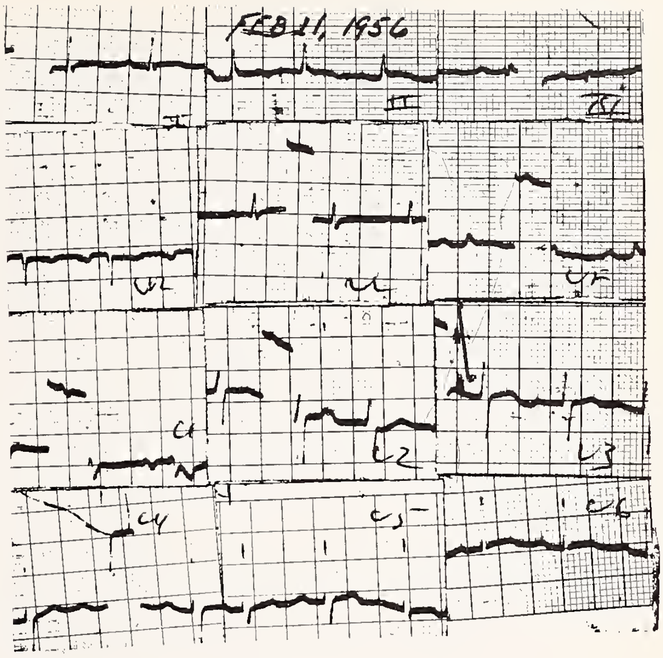

FIGURE I

The physical examination revealed dyspnea without cyanosis, fever with moist skin, a nasopharyngitis, and signs of emphysema, which may have accounted for his faint heart sounds. The most significant findings were grade 3 edema of the legs and inspiratory rales at the lung bases, implying a congestive heart failure of both left and right ventricular types. Confirmation is found in the initial chest x-rays, which showed a very large heart and pulmonary congestion along with a small pleural effusion behind the heart. The large cardiac silhouette could, of course, have represented a large pericardial effusion, but the configuration is not typical of a waterfilled pericardial sac, and so large an effusion forming so rapidly would be ex-

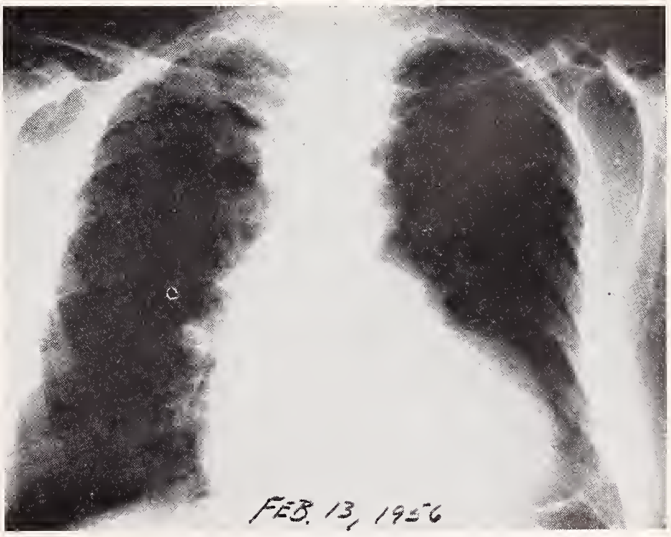

FIGURE II

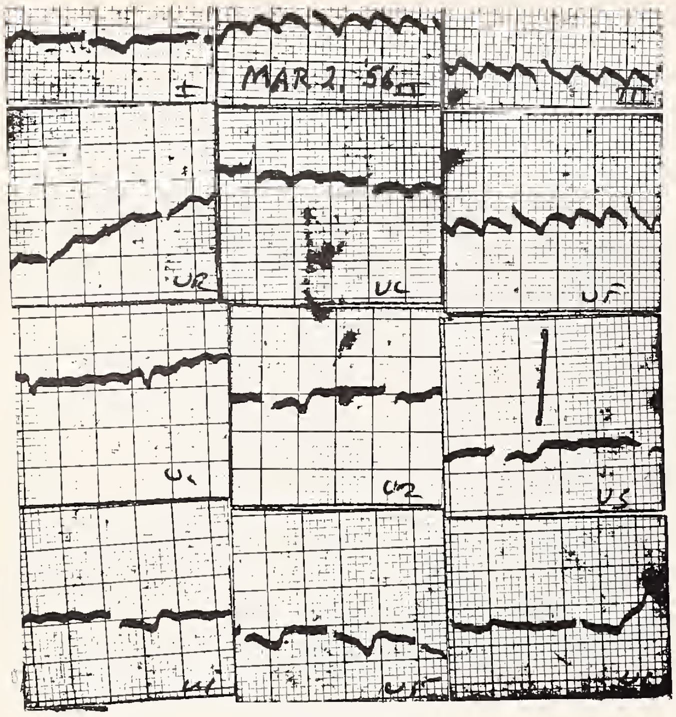

Figure III

pected to have produced signs of cardiac tamponade, in which the impeded venous return to the heart would result in neck vein distension, a small stroke volume and output and these, in turn, should cause the blood pressure to fall, the pulse pressure to become small, and the heart rate to become very rapid. None of these signs of cardiac tamponade was evident in the blood pressure of 140/80 and a pulse rate of 94, in a febrile patient, and venous fullness was not mentioned. Further confirmation that congestive failure had probably been present was provided by the disappearance of the stated symptoms and signs of congestion during the first week's treatment with digitalis, oxygen and rest.

However, on the eighth hospital day, two weeks from the onset of the illness, the patient again complained of anterior chest pain, and now a loud pericardial friction sound was audible. This was probably not due to a recurrence of myocardial infarction because the friction sound of such associated pericarditis usually does not appear for one or two days following the infarction. Pulmonary embolism is a more likely diagnosis, and in this case the simulaton of a transient pericardial rub can occur through distension of the main pulmonary artery so as to bring about frictional contact with the substernal tissues. Perhaps the Dicumarol was now introduced for this reason. The ECGs of this day, however, showed no evidence of massive pulmonary embolism, and I think a more likely diagonsis of the pain and pericardial rub is the idiopathic and relatively benign type of pleurits and pericarditis that has been described by Dressler as occuring occasionally as a post-myocardial infarction syndrome two or more weeks after an infarction. Following this, the course was again uneventful for two weeks, except for transient atrial flutter shown in the ECGs of March 2; the last would be unusual in idiopathic pericarditis and so is additionally suggestive of myocardial infarction as the initial illness.

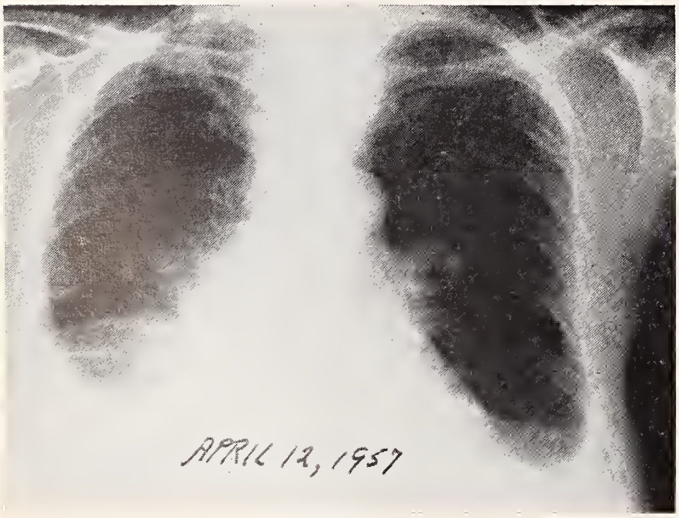

Figure IV

On March 5 he again had chest pain, cough and high fever, without leukocytosis. X-ray showed a very large left pleural effusion, which could again have been an expression of the Dressler syndrome, or of pulmonary embolism and infarction. Antibiotics are ineffective under these conditions. However, they were given, and after three days the temperature was again normal, and a third chest x-ray a week later showed no significant residual pleural fluid or parenchymal lesions, and the cardiac silhouette was approximately normal, presumably as a benefit of rest, digitalization and oxygen therapy he had received. All subsequent x-rays showed varying amounts of pleural fluid bilaterally, with indeterminable heart size. Laboratory tests included urine analyses, serum electrolyte measurements, blood sugar and NPN, and they were all normal, but a first strength PPD skin test gave a strongly positive reaction. ECGs on March 19 now showed prolonged A-V conduction as well as the previous moderately low QRS voltage and non-specific S-T and T wave abnormalities in all leads. For reasons that are not given us he had a G-I x-ray examination, which gave normal results, and a Graham-Cole test, which showed gallstones and a non-functioning gallbladder.

By May, 1956, the signs of congestive failure returned and persisted, in spite of continued adherence to a good cardiac supportive regimen. Although there were always some moist rales at the lung bases and pleural effusions in variable amount the signs of right heart failure predominated, as indicated by the absence of orthopnea or of dyspnea except with exertion, and by the presence of hepatomegaly and deep edema of the legs and genitalia, but no ascites. The heart sounds continued faint, and the blood pressure declined to low normal ranges, due either to left ventricular weakness or to a restricted venous inflow to the heart, about which more will be said presently.

We are told that the arm to tongue circulation time was extremely long, in being 40 to 50 seconds, and this helps to exclude all the uncommon varieties of so-called high output failure as playing a role in the refractoriness of the congestive failure; such diseases include thyrotoxic heart disease, beriberi, anemic heart disease, A-V fistula, and most cases of chronic cor pulmonale. It is reported that the serum electrolytes continued normal, so that his unresponsiveness cannot be attributed to such derangements. The extent of the recorded abnormalties of liver function was within the range that is acceptable for chronic passive congestion of the liver except, perhaps, for the alkaline phsophatase values of 16 and 18 Bodanski units. However, Dr. Gerald Klatskin, who was consulted on this detail, was able promptly to produce the protocols of several patients in whom comparably high values developed solely in association with chronic passive congestion of the liver, as proved by biopsy or a post mortem examination.

We are also told that the venous pressure was unusually high; it was 230 mm. saline, and later was measured at 270 mm. Such extreme venous hypertension is seldom, if ever, seen in congestive heart failure of common etiological types and suggests the additional presence of a primary pericardial or myocardial disease of unusual type, and this in turn may help explain why the patient's congestive failure proved so refractory to treatment.

From December onward all the ECGs showed extremely low QRS voltage, persistent A-V block of varying degrees, and persistent non-specific S-T and T abnormalities (Fig. V).

In the last admission on August 14, 1957, the patient was described as thin; he had been obese at the beginning of his illness. The symptoms and signs of advanced and predominantly right heart failure were even greater than before, and again the refractoriness and advancing congestion could not be attributed to anemia, infection, electrolyte depletions or renal failure, as judged from the laboratory reports, but by now the serum albumin had fallen below the edema level, probably as another expression of failing hepatic function in a chronically congested liver, and this could well have contributed to his increasing edema. Ascites was not mentioned. Thoracentesis yielded a clear fluid, whose specific gravity indicated a transudate, which gives strong support to congestion as the cause for the bilateral pleural effusions that waxed and waned throughout the illness. The pulse was very slow, and ECGs indicated complete A-V block. Under vigorous diuretic therapy the edema and pleural effusions seemed to be decreasing when, on August 22, he developed shock, acute respiratory distress with wheezes and cyanosis, but no pain. He was treated now for acute pulmonary edema, which may well have been the case, but three days earlier an x-ray had suggested to me an infarct in the left upper lung field.

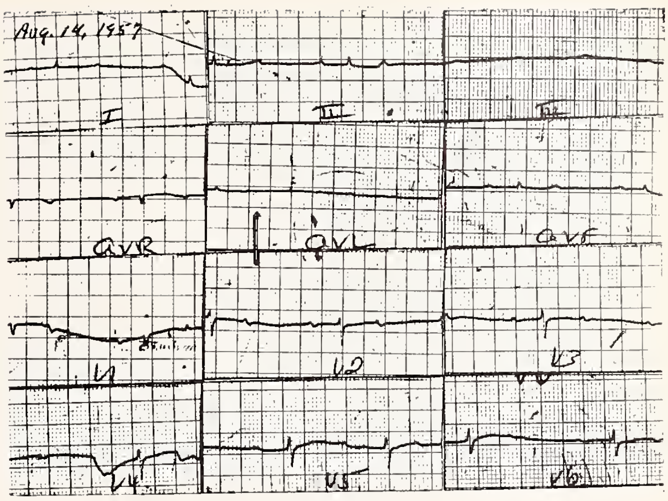

Figure V

My diagnosis is acute myocardial infarction occurring on February 4, 1956, with the early course complicated by congestive heart failure, with an initial but only a temporary response to cardiac therapy. The early course was also complicated by idiopathic pleuro-pericarditis on one occasion and probably by pulmonary embolism on another.

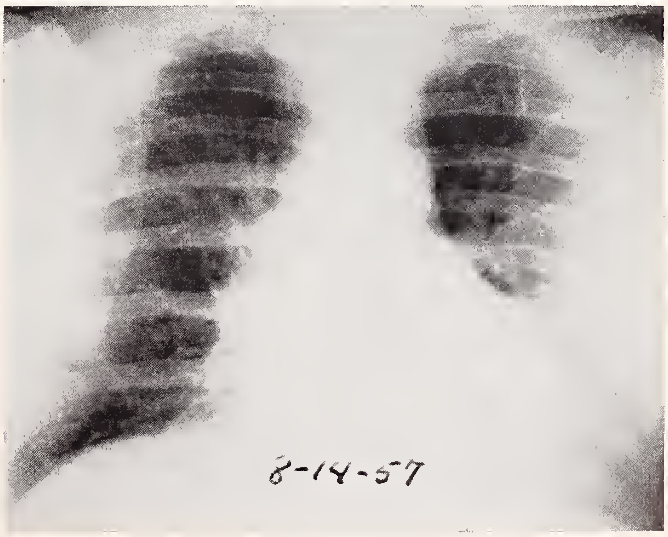

Figure VI

However, the patient's unusually refractory congestive failure is a disturbing feature and requires further consideration and explanation. A massive myocardial infarction might leave a heart so disabled, but there are several reasons why I do not believe that his original myocardial infarction had been massive. In the first place, he survived in spite of walking about with it for a week. Only the first ECG of his long series, that of February 11, 1956, gave even a suggestion of an acute posterior area of injury, while subsequent ECGs did not evolve into strongly diagnostic features that would be expected with extensive myocardial infarction; particularly, no abnormal Q or Q-S deflections ever developed.

Repeated pulmonary embolizations can lead to refractory right heart failure, but the patient did not exhibit the expected dyspnea, cyanosis, or polycythemia of chronic cor pulmonale, nor did he ever develop the ECG features of chronic cor pulmonale. On the contrary, the ECGs were remarkable for the evidence of *diffuse* myocardial disease they exhibited, in terms of paroxysmal rhythm disturbances (atrial fibrillation and flutter), in variable degrees of non-specific S-T and T wave abnormalities in all leads, and in progressive A-V block. Finally, the very high venous pressures exceeded what one encounters with congestive failure due to common etiological types of heart disease and suggest the concomitant presence of a primary atypical myocardial disease of one of the so-called myocardial constrictive or restrictive types, such as chronic constricting pericardium or endocardium (endocardial fibroelastosis) or a diffuse myocardial infiltration by fibrous tissue, granuloma, metastatic carcinoma or amyloid.

I believe one of these conditions is present in our case. Of constricting pericardium there is contrary evidence in that he lacked the usually conspicuous and cardinal finding of ascites, which ordinarily precedes and overshadows any edema; there was no apparent thickening or calcification of the pericardium; the early changes in heart size were too great, and only very late in the course did he have low blood pressure and pulse pressure that usually prevail.

Endocardial fibroelastosis is difficult to include in this instance. One would expect to have had more evidences of systemic as well pulmonary embolizations, because intracardiac thrombus formation is characteristic of this condition. I think that the clinical course was too rapidly downhill for the adult form of this disease.

Sclerodermal invasion of the heart cannot be diagnosed in this case in the absence of other signs of the disease, such as skin lesions, muscle stiffness or pulmonary fibrosis.

Sarcoidosis with heart invasion is rare in a man of this advanced age and seems further unlikely in view of the strongly positive tuberculin reaction he exhibited, for most cases of sarcoidosis have an anergy to this antigen. Moreover, he had no pulmonary or renal evidences of such granulomatous invasion, although it is possible that the rather high alkaline phosphatase values in the serum reflected the presence of such granulomata in the liver. I shall pass over possible sarcoidosis and endocardial fibroelastosis in favor of amyloidosis of the primary type, which is a disease of older men and does produce refractory heart failure of the restrictive type, with unusually high venous pressures, and also gives ECG evidences of diffuse atrial and ventricular muscle involvement, as was the case in this instance.

So, to my diagnosis of initial myocardial infarction complicated by idiopathic pleuro-pericarditis I shall add the diagnosis of a concomitant primary disease of one of the diffuse myocardial restrictive types, probably amyloid, resulting in refractory congestive failure, chiefly of the right ventricular type.

PATHOLOGIC FINDINGS

Dr. Hales

The significant lesions in this patient were on but not in the heart. The pericardial cavity was obliterated, and the small, 270 gram heart was firmly encased in a thickened, fibrous, constricting pericardium; through this, it was firmly bound to the sternum and lower costal cartilages, the diaphragm, and the adjacent mediastinal aspects of the lungs. The adherent mass of pericardial tissue averaged almost 3 mm. in thickness, and in some sites, it was at least double that (Fig. VII). It did not constrict the vena cava or pulmonary veins, or their ostia. Grossly, the thickened adherent peri-

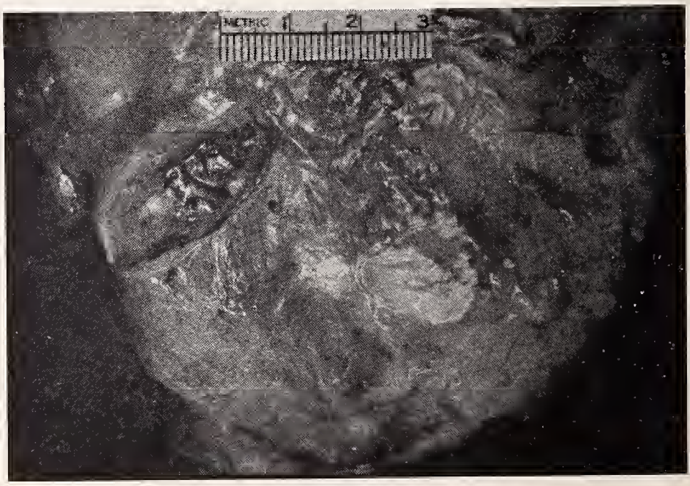

Figure VII

Apical portion of heart. Incisions reveal the thickened, adherent pericardium to measure as much as 6 mm. in depth.

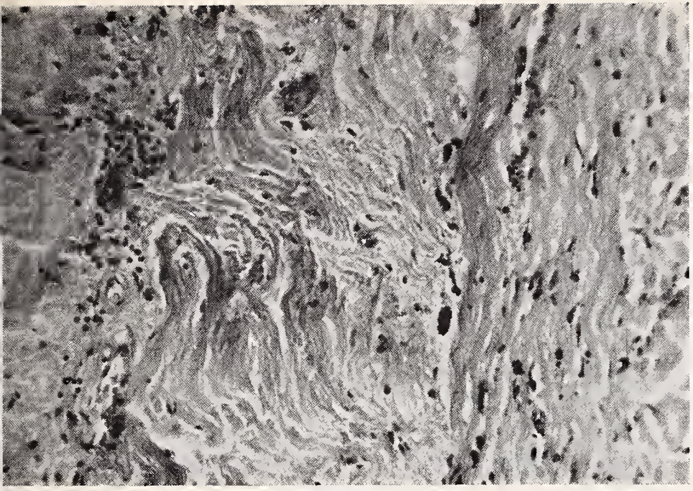

Figure VIII

The constricting fibrous pericardium contains a few focal collections of lymphocytes (left margin above), and hemosiderin-filled macrophages (to the right of center above).

cardium appeared entirely fibrous, with no evident caseation or calcification. Microscopically it was represented by avascular and acellular hyaline connective tissue, with small collections of lymphocytes and significant numbers of hemosiderin-filled macrophages (Fig. VIII). In the most peripheral portion of the underlying myocardium, there were foci of interstitial and perivascular fibrosis, often associated with distortion of the persistent muscle fibers (Fig. IX). No deeper or larger scars were seen, and there were no signs of old or recent infarct. Minimal atherosclerotic changes were present in the coronary arteries, but with no significant narrowing of their patent lumina.

The other major findings were attributable to congestive heart failure, predominantly right ventricular type. The legs and scrotum were moderately edematous. Over 1500 ml. of clear yellow fluid were present in each pleural cavity. but only 100 ml. were present in the peritoneal cavity. Gross and microscopic changes of acute and chronic passive congestion were present in the liver and the slightly enlarged spleen. The capsules of the latter viscera were thin and transparent. The right and left lungs were moderately congested and edematous.

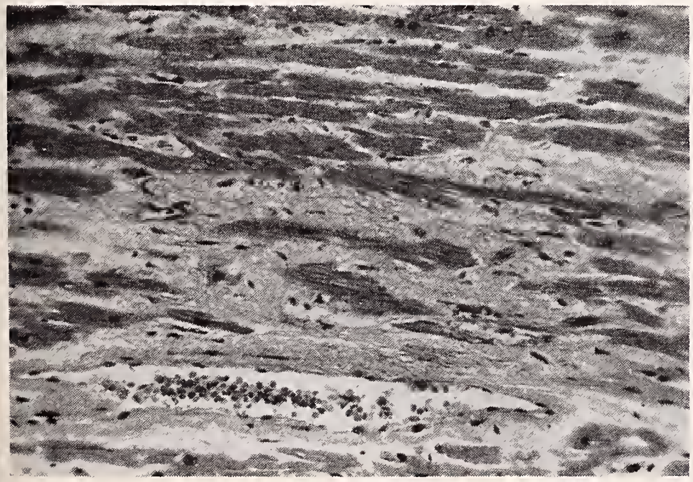

Figure IX

Tiny foci of interstitial and perivascular fibrosis are present in the outermost portion of the myocardium.

Incidental and subsidiary findings included moderately severe atherosclerosis of the aorta and the cerebral arteries. Two calculi were present in the contracted, fibrotic gallbladder.

Clinical Diagnosis

Arteriosclerotic heart disease, with old and recent myocardial infarcts; congestive heart failure.

Anatomical Diagnosis

Primary: Constrictive pericarditis; bilateral pleural effusions and minimal ascites; peripheral edema; acute and chronic passive congestion of abdominal viscera; edema and acute passive congestion of lungs.

Subsidiary: Generalized arteriosclerosis; cholelithiasis and chronic cholecystitis.

Comment

Under the heading of the post-myocardial infarction syndrome, or coronary pericarditis, Dressler has pointed out that clinical or subclinical myocardial infarction may be followed in weeks or months by the picture or acute pericarditis; when the relationship to the myocardial infarct is not recognized, an erroneous diagnosis of acute benign pericarditis may result. In contradistinction to Dressler's syndrome, the present case was that of an acute benign pericarditis erroneously interpreted as acute myocardial infarct. This is not an uncommon error. In fact, the first significant report in the American literature, that of Barnes and Burchell in 1942, was titled "Acute Benign Pericarditis Simulating Acute Coronary Occlusion." Since Barnes' and Burchell's original report of 14 cases, well over 100 cases have been added to the literature. Many of the authors have stressed the great importance of making the distinction between myocardial infarction and acute benign pericarditis, since anticoagulant therapy is definately contraindicated in the latter. Indeed, in three of the five fatal cases of this "benign", disease, death was attributable to hemopericardium and cardiac tamponade secondary to anticoagulant therapy. While our case today was so treated and did not develop tamponade, the hemosiderin remaining in the constricting pericardium strongly suggests that percardial hemorrhage did occur during the acute illness and contribute to the later complication of constriction.

At least a majority of the reported cases of constrictive pericarditis are of entirely obscure etiology. Today's case would also have been so considered had not the old clinical record and x-rays been available for retrospective perusal. Occurring in a subclinical form, acute benign pericarditis may well be the cause of many of the cases of idiopathic constrictive pericarditis. Patients with the latter disease often recall in retrospect an earlier acute illness suggestive of acute benign pericarditis, although ours is only the fifth well documented case followed clinically from the acute phase of the illness to actual constrictive pericarditis. Why an occasional instance of acute benign pericarditis should go on to constriction, while most resolve completely and without residua, is unknown. Intrapericardial hemorrhage of minor degree may accompany the acute episode even in the absence of anticoagulants, and it may well be that significant hemorrhage and its organization are the factors responsible, as in today's example. If so, it is doubly important that the correct diagnosis be made initially, and anticoagulant therapy avoided.

While demonstrating that acute benign pericarditis may lead to the development of constrictive pericarditis, the basic etiology of the acute disease of our patient remains obscure. The fever, leukocytosis, and signs of upper respiratory infection at the time of onset suggests an infectious etiology, just as in many of the other reported cases. During the past few years, some cases have been proven to be caused by the Coxsackie virus, others to infectious mononucleosis, and some even to influenza. With the development of better cultural and serologic techniques, we can hopefully anticipate that more and more cases of acute benign pericarditis will be transferred from the idiopathic to the specific category.

CONCLUDING REMARKS

Dr. Geiger

Although my diagnosis of amyloid disease of the heart lay within the group of "myocardial restricting diseases," and which Dr. Beeson so kindly characterized as the right diagnosis for the data given, if not exactly the correct one, there is little satisfaction with a diagnosis that is a near miss when it concerns a surgically remediable disease such as chornic constricting pericardium.

Why had no one among the many who attended this patient in three hospitalizations made the diagnosis; more pertinently, why did I discard the diagnosis even after having considered it seriously? I cannot answed for the others, but my reasoned rejection of a constricting pericardium was determined by several factors such as the various arrhythmias and the progressive A-V block implying a diffuse heart *muscle* disease, but chiefly because of the absence of ascites — a feature which, together with a small and quiet heart and low systolic and pulse pressures constitute the diagnostic triad established 25 years ago by Dr. Claude Beck. Massive ascites is almost invariably a prominent feature, usually appearing either without edema of the legs or considerably preceding and overshadowing any dependent edema that may develop. In this case massive edema of the legs appeared early and ascites never developed at all. This is unique in my experience but is admittedly not unknown.

The acute pericarditis of idiopathic type that characterized the initial acute phase of the illness also had unusual and atypical features. Evidently a large pericardial effusion had formed sufficiently rapidly to produce cardiac tamponade with venous inflow block resulting in edema of the legs and dyspnea but with no apparent resulting hypotension, tachycardia or venous distention — which constitute the cardinal signs of acute cardiac tamponade. Nor were other diagnostic clues noted, such as Ewart's sign or paradoxical pulse, which would have been expected in so outspoken a pericardial effusion. Small wonder that the case was incorrectly diagnosed and treated as acute myocardial infarction with congestive failure until two early relapses of acute pericarditis revealed the essentially pericarditic nature of the disease.

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(carisoprodol, Wallace)

Wallace Laboratories, Cranbury, New Jersey

171st ANNUAL MEETING
# of the
CONNECTICUT STATE MEDICAL SOCIETY

Statler-Hilton Hotel
10 Ford Street, Hartford, Connecticut
April 30, May 1, 2, 1963

PROGRAM COMMITTEE

Harvey W. Kaetz, *New Haven, Chairman*
Allen M. Margold, *Norwalk*
Peter J. Scafarello, *Hartford*

PRELIMINARY PROGRAM

Tuesday, April 30

Mezzanine Floor

Annual Meeting of the House of Delegates

Michael R. Scully, *Bridgeport, Speaker of the House, presiding*

10:00 Call to Order
Business Session

1:00 Luncheon for Officers, Members of the House and Guests

2:00 Resumption of Business

Wednesday, May 1

Mezzanine Floor

9:00 Registration

9:30 Call to Order—President of the Society
Address of Welcome—President, Hartford County Medical Association

9:45 Emphysema
Julius L. Wilson, New York City

10:30 Rheumatoid Arthritis Variants
James W. Hollingsworth, New Haven, Connecticut

11:10 Intermission to Visit Technical Exhibits

11:40 An Evaluation of the Tobacco-Cancer Relationship,
Ernest L. Wynder, New York City

12:20 Cancer of the Uterine Cervix and Corpus in Connecticut (Epidemology)
Presented by: John C. Bailor, III, Bethesda, Maryland
Authors: John C. Bailor III, Louis B. Thomas, Andrew W. Thomson

1:00 Luncheon
Intermission to Visit Technical Exhibits

2:00 Clotting Tests of General Application
James L. Tullis, Boston, Massachusetts

2:40 Deciphering The Genetic Code
Peter Lengyel, New York City

3:30 **Meetings of Sections of the Society and Guest Organizations**

Section on Dermatology
Section on Gastroenterology
Section on Neurology
Section on Neurosurgery
Section on Obstetrics & Gynecology
Connecticut Society of American Board Obstetricians and Gynecology } Joint Meeting
Section on Pathology
Section on Preventive Medicine and Public Health
Section on Occupational Health } Joint Meeting
Section on Urology
Connecticut Diabetes Association
Connecticut Society of American Board Internists

7:00 **Annual Dinner of the Society**

Thursday, May 2

MEZZANINE FLOOR

9:00 REGISTRATION

9:45 CANCER CHEMOTHERAPY
DAVID KARNOFSKY, New York City

10:30 DELAYED EFFECTS OF SOMATIC RADIATION
WILLIAM C. MOLONEY, Boston, Massachusetts

11:10 INTERMISSION TO VISIT TECHNICAL EXHIBITS

11:40 PULMONARY SARCOIDOSIS
ABRAHAM H. RUSSAKOFF, Birmingham, Alabama

12:20 INVESTIGATING AUTOMOBILE FATALITIES
WILLIAM F. ENOS, Fairfax, Virginia

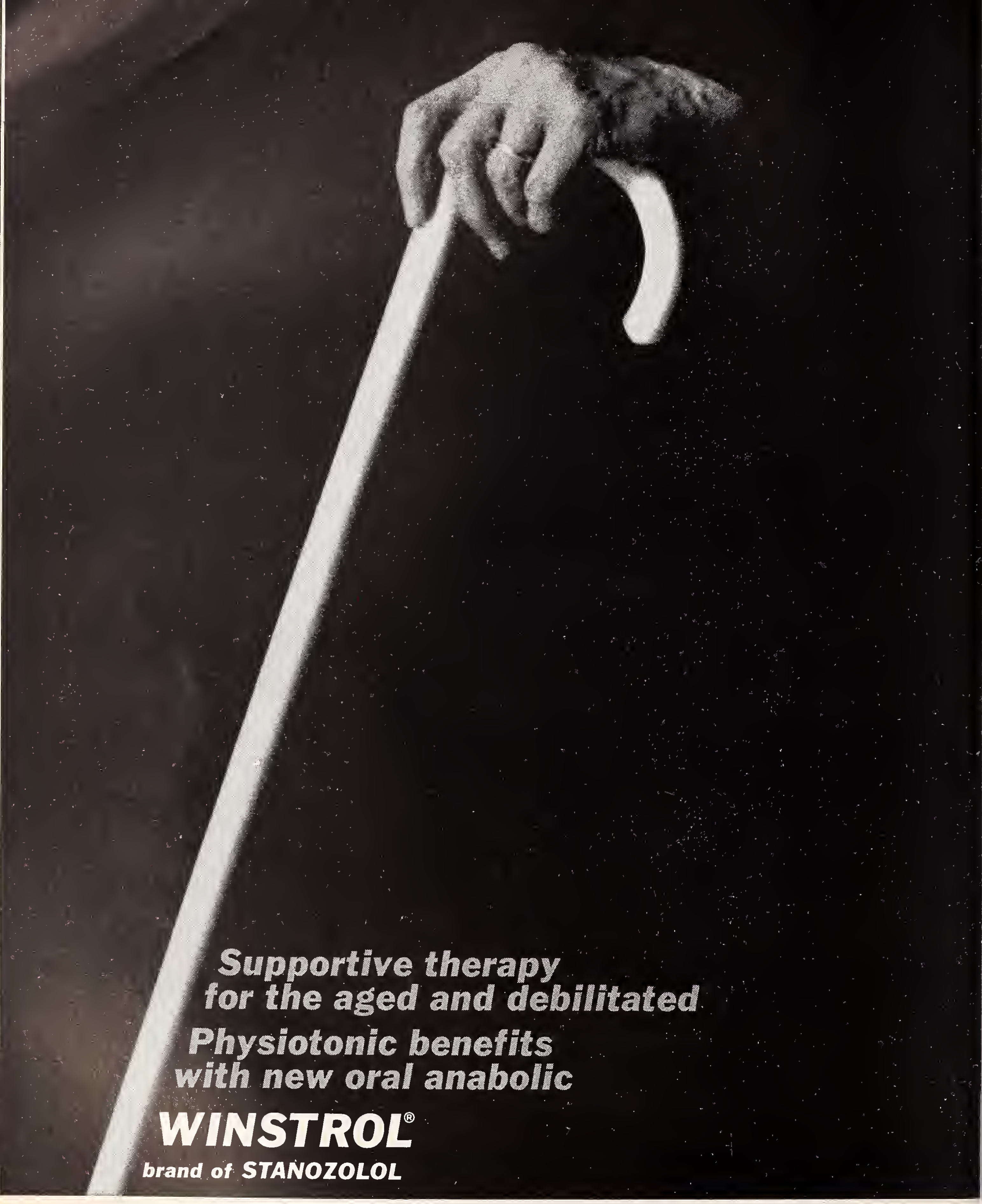
1:00 LUNCHEON
INTERMISSION TO VISIT TECHNICAL EXHIBITS

PROGRAM ARRANGED WITH THE CONNECTICUT SOCIETY OF AMERICAN BOARD SURGEONS

2:00 TO BE ANNOUNCED

3:30 **Meetings of Sections of the Society and Guest Organizations**

Section on Allergy
Section on Anesthesia
Eye, Ear, Nose & Throat Section
Section on Orthopaedics (Hunt Memorial Building)
Section on Physical Medicine
Section on Proctology
Connecticut District Branch-American Psychiatric Association
Section on Radiology
Association of Medical Examiners of Connecticut
Connecticut Rheumatism Association
Hezekiah Beardsley Pediatric Club



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Around The State

New Two-Year Internship Leads To Family Practice "Specialists"

Establishment of a new two-year internship designed to help qualify graduate physicians as "specialists" in family practice has been announced by Dr. Ralph E. Snyder, President and Dean of New York Medical College, and Sister Anne Jean, Administrator of St. Joseph's Hospital, Paterson, N. J.

The joint announcement said the pilot program had been approved by the American Medical Association. The College will supervise the curriculum and the new-type "family doctor" will train in St. Joseph's Hospital.

Family Practice A Specialty

The program, available to six doctors each year, will be geared to the concept that family practice should be treated as a medical specialty and that there should be a fuller utilization of medical teaching talents now available at the level of a good community hospital.

The two-year internship is the first to be jointly sponsored by a Metropolitan-area medical school and a voluntary community hospital.

Organization and conduct of the program will be under the direction of Dr. Robert O'Connor, Assistant Dean at the College, and Dr. Kendrick P. Lance, Director of Medicine and Medical Education at St. Joseph's Hospital.

Dr. Snyder said New York Medical College chose the Sisters of Charity Hospital because it is the largest voluntary community hospital in New Jersey and "its staff and administration are highly qualified with a deep interest in education."

Staff And Faculty To Participate

While the teaching program will stress active participation of the hospital's own staff members (many of whom teach in area medical colleges), specialists from the college faculty will also participate through lectures, demonstrations and bedside rounds.

"By bringing into fuller utilization the medical teaching talents available at a good community hospital," explained Dr. Snyder, "we take a forward step in meeting the growing needs for medical education. Many physicians on the staffs of community hospitals, like St. Joseph's, are as well qualified as medical school faculty members. Why overlook their skills simply because they lack the title of professor?"

The program will provide training in depth in general medicine and pediatrics as well as instruction in problems which a family practitioner would encounter within the field of general and special surgery.

The first year of daily hospital service and teaching will cover four months of medicine; two of pediatrics; two of obstetrics and gynecology; and four of surgery. The second year will offer four months of pediatrics and medicine; two of obstetrics and gynecology and two of an elective.

Medical Areas Differ Each Month

Each month, a different area of medical practice will be covered from the viewpoint of the family physician. During the first year, monthly topics will include: adult infectious diseases, cardiovascular diseases, psychiatry and neurology.

Six interns will be accepted annually so, in the second year, the program will function from then on with 12 interns. Plans call for the program to include next year's graduates of medical colleges from all over the country.

New York Medical College is the heart of a vast medical city encompassing over 3,500 beds, a faculty of nearly 1,000, five hundred students and some 5,000 employees. Over $4,000,000 of research is undertaken annually, more than 12,000 operations are performed and medical treatment given to one half million patients a year.

St. Joseph's which has 524 beds, is owned and administered by the Sisters of Charity of St. Elizabeth of New Jersey who have four other Jersey hospitals, one in Suffern, N.Y., and another in New Haven, Connecticut.

Hartford County

Dewey Katz of Hartford was elected president of the New England Ophthalmological Society for the year 1963-64.

Dr. Katz was recently a member of an Around the World Ophthalmological Seminar sponsored by the New York Society for Clinical Ophthalmology.

While on this seminar he gave an instructional course at the annual meeting of the American Academy of Ophthalmology and Otolaryngology at Las Vegas; lectured in Manila at the annual meeting of the Ophthalmological Society of the Philippines; lectured in Jerusalem at the Hadassah Hebrew University Medical Center; participated in meetings of the Japanese Ophthalmological Society, the Hong Kong Ophthalmological Society, the Bangkok Ophthalmological Society and the 19th International Congress in Ophthalmology in New Delhi, India.

New Haven County

The 179th Annual Meeting of the New Haven County Medical Association will be held at the Waverly Inn, Cheshire, on Thursday, March 28, 1963 at 2:30 P.M., the time scheduled for the business meeting.

The agenda for this meeting consists of election of officers, committees, delegates and alternate delegates to the House of Delegates of the Connecticut State Medical Society for the year 1963-1964.

The members of the Woman's Auxiliary will hold a tea and social hour while the meeting is in session.

After a social hour and dinner with the ladies the new president, Louis C. Backhus of Waterbury will be presented and the retiring president Waldo E. Martin of Milford will favor us with the customary address. The president (out-going) will also receive his plaque at this time.

The after dinner speaker will be Mr. Edward Migdalski of Hamden. His subject will be "Exploring British Guiana and the Amazon." Mr. Migdalski is with the Oceanographic Department at Yale University.

At this meeting previously elected members will be guests of the Association and will be introduced to the membership and presented with their membership certificates

Dinner is scheduled for about 7:00 P.M.

Doctor's Office

William H. Bockman, M.D., announces the opening of an office for the general practice of medicine at 1490 Park Avenue, Bridgeport.

Malcolm Brochin, M.D., announces the opening of offices for the practice of obstetrics and gynecology at 186 Sherman Avenue, New Haven, and the Madison Medical Center in Madison.

Julian A. Estrada, M.D., announces the opening of an office for the practice of orthopedic surgery at 60 Bridge Street, New Milford.

Henry J. Grycz, M.D., announces the opening of an office for the general practice of medicine at 432 Maple Avenue, Cheshire.

Frederick J. Kardys, M.D., who maintains a practice in Hartford, announces the opening of an office for the practice of thoracic and general surgery at 5 North Main Street, Enfield.

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New Drugs And Techniques For Cancer

This is the second in a series of reviews of chemotherapeutic agents used in the treatment of malignant tumors. The first (The Medical Letter, 3:77, 1961) considered the alkylating agents. Most of the drugs and techniques discussed in the present review are still in the investigational stage. The choice by a physician of an anticancer drug for a patient is not easy, in view of rapid developments in screening and experimental trial of such agents. He can usually get help from tumor boards of major hospitals, particularly those associated with medical schools, as well as from special cancer research institutions and hospitals. Government grants have been made to many hospitals for the free care (including travel expenses) of patients with cancer, as well as certain other serious diseases, who are willing to accept the requirement of experimental trial of chemotherapeutic agents.

ANTIBIOTICS—Actinomycin D (Merck)—Of the several actinomycins tried in cancer patients, only Actinomycin D is currently available for experimental clinical use. It has been most effective for certain childhood tumors, particularly Wilm's tumor with pulmonary metastases; and it has been useful in some instances of choriocarcinoma resistant to methotrexate. In combination with chlorambucil and methotrexate, Actinomycin D has produced remissions of certain testicular tumors (see below). When given simultaneously with local irradiation, it has also been found useful as a tissue sensitizer in some types of cancer. In excessive doses, severe toxic effects may develop rapidly; these include painful cheilosis and glossitis, oral ulceration, and bone-marrow depression. Mitomycin C is another antibiotic available only for experimental trial. It has an occasional effect against Hodgkin's disease and ovarian cancer.

ANTIMETABOLITES — Methotrexate, USP (Lederle)—formerly called amethopterin—not only has a well established effect in the palliation of acute leukemia in children, but it has also proved valuable in treating metastatic choriocarcinoma in women (it is much less effective against choriocarcinoma in men). Seemingly complete remissions of widespread metastases have been obtained for as long as five years in about 40 per cent of the female patients. Courses of methotrexate are best given orally in doses of 15 to 25 mg. daily for a period of five days, and repeated until tumor response or toxicity occurs (bone-marrow depression, oral ulceration or bleeding, and impaired renal function).

The use of Actinomycin D in combination with chlorambucil and methotrexate in the management of choriocarcinoma and embryonal cell carcinoma of the testes has resulted in remission rates of 35 per cent, with prolonged disappearance of metatases in about 6 per cent of the patients.

PURINE ANTAGONISTS—6-Mercaptopurine, USP (6MP; Purinethol—Burroughs Wellcome). Although this is the most useful drug available for acute leukemias in adults, it is ineffective against the solid cancers, as well as against lymphomas, and chronic lymphocytic leukemia.

PYRIMIDINE ANTAGONISTS—5-Fluorouracil and 5-Fluorodeoxyuridine (5FU and 5FUDR—Roche) are recent additions to experimental anticancer drug resources. The former is much cheaper and more readily available. (For a comprehensive review of the indications, doses and toxicity of these drugs, see R. R. Ellison, Med. Clin. N.A., 45:677, May 1961.) With 5FU, significant tumor regression has been observed in metastatic breast cancer, and to a lesser extent in gastrointestinal-tract malignancy. Patients who do not respond to hormone treatment of metastatic breast lesions may respond to alkylating chemicals or to 5FU.

The usual dosage schedule for 5FU is 15 mg./kg. of ideal weight, given intravenously each day for three or four days; then half to two thirds of this dose is given every other day if toxicity does not develop. Extreme caution in administration is required since toxic reactions to 5FU (and 5FUDR) may be abrupt and severe, consisting of vomiting, bloody diarrhea, severe depression of the bone marrow, and painful ulcerations of the oral cavity. Serious toxic symptoms, sometimes fatal, may not appear until eight days after the last dose (C. G. Zubrod, JAMA, 178:832, 1961).

VINBLASTINE SULFATE (Velban—Lilly), an alkaloid derived from the periwinkle plant (Vinca rosea), is currently undergoing clinical evaluation. It has been used with some success against cases of Hodgkin's disease refractory to irradiation and alkylating agents, and significant effects have also been reported in solid cancers, as well as against acute monocytic leukemia. However, one Medical Letter consultant failed to observe significant remissions of solid cancers even when the drug was given at toxic levels.

o,p'DDD (2, 2-bis[4-chlorophenyl, 2-chlorophenyl] 1, 1-dichloroethane)—Medical Letter consultants have confirmed the value of this oral agent (available as yet for experimental trial only) in causing regression of lesions in patients with hyperfunctioning adrenal cortical cancer. The toxicity of o,p'DDD is relatively mild (D. M. Bergenstal, et al., Ann. Int. Med., 53:672, 1960).

Reprinted from The Medical Letter on Drugs and Therapeutics, New York, N.Y.

Special Notices

MEDICAL AND SURGICAL DISEASES OF THE LIVER

Norwalk Hospital

April 2-30, 1963

All lectures will be held in April, 1963 on Tuesday nights from 8 to 10 P.M. in the Nash Auditorium of the Norwalk Hospital. The lecturers are:

Harold O. Conn, m.d., Assistant Professor of Medicine, Yale University School of Medicine.

LeRoy A. Pesch, m.d., Assistant Professor of Medicine, Yale University School of Medicine.

Roy N. Barnett, m.d., Associate Clinical Professor of Pathology, Yale University School of Medicine.

Program

April 2: Physiology of liver.
Bilirubin metabolism—Dr. Pesch.
Other aspects—Dr. Conn.

April 8: Anatomy of liver—Dr. Barnett.
Needle biopsy—techniques, value, case studies—Drs. Pesch and Barnett.

April 16: Hepatitis; epidemiology, variants, management, prevention—Drs. Conn and Pesch.

April 22: Cirrhosis; types, diagnosis, management—Dr. Conn and Barnett.

April 30: Miscellaneous diseases.
Hemochromatosis—Dr. Conn.
Pigment disorders; autoimmunity in liver diseases—Dr. Pesch.

Participants will receive a prepared outline of the material, bibliography, etc. The fee is $25.00, payable to the Norwalk Hospital. Advance registration is required through the Department of Medical Education, Norwalk Hospital, Norwalk, Conn. Limited to 60 registrants.

SCRIPPS CLINIC AND RESEARCH FOUNDATION PROGRAM

A nine month tutorial program in Cardiology, September 15, 1963 – June 15, 1964, will be offered by the Institute for CardioPulmonary Diseases, Scripps Clinic and Research Foundation, La Jolla, California.

This will be an intensive, academic effort covering the field of cardiovascular diseases and is especially designed for the practitioning physician who desires thorough instruction in this field and for the physician who is finishing his period of formal training and wants a final intensive orientation in cardiology.

For details, write: Executive Secretary, Institute for Cardio-Pulmonary Diseases, Scripps Clinic and Research Foundation, La Jolla, California.

MEDICINE AND THE LAW

A Symposium
Sponsored by the Conference Committee
of the
Connecticut Bar Association and
Connecticut State Medical Society

WAVERLY INN, CHESHIRE

Monday, March 18, 1963

Program

4:00 p.m. Registration.

4:15 p.m. Introductory Remarks: Peter V. C. Dingman, M.D., Alexander Winnick, Esq., Attorney, Chairmen
The Impartial Medical Panel.
William J. Secor, Jr., Esq., Attorney, Moderator.
Alfred Julien, Esq., Attorney, Past President National Association of Claimants—Compensation Attorneys.
Harry Sherman, M.D., F.A.C.S. Specializing in Surgery of Trauma.
Associate Justice Aron Steuer, Justice Supreme Court, State of New York, Appellate Division.
Preston Wade, M.D., F.A.C.S., Past President, American Association for Surgery of Trauma.

6:30 p.m. Cocktails and Dinner.
Cocktails: Dutch Treat.
Dinner: $6.50 per person.
Malpractice Litigation: The California Experience.
Joseph F. Sadusk, Jr., M.D. Professor of Preventive Medicine and Community Health, George Washington University, Chairman, Committee in Medicolegal Problems, AMA.

POST GRADUATE EDUCATION COMMITTEE

MAY 27 — MAY 31, 1963

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In Memoriam

Bergin, Thomas J.—Cos Cob; Yale Medical School, 1899. Dr. Bergin was a former resident of New Haven and the father of a Yale professor, who is master of Timothy Dwight College and Sterling Professor of Romance Languages at Yale. Dr. Bergin served as a Captain in the Medical Corps with the U.S. forces in France. Dr. Bergin was attending surgeon at Greenwich Hospital. He was a member of the American Medical Association, the Connecticut State Medical Society, and the Fairfield County Medical Association. Dr. Bergin died January 10, at the age of 87.

Case, Edward P.—West Hartford; University of Michigan Medical School, 1911. Dr. Case was an American Red Cross director in Constantinople from 1915-17, and served with the American Expeditionary Force in France from 1917 to 1919. He was a medical adviser to the group department at the Travelers Insurance Company from 1920 to 1925, and had been physician and surgeon for the Underwood Typewriter Company since 1925. He was a member of the Connecticut State Medical Society and the Hartford County Medical Association. Dr. Case died January 11, at the age of 79.

Turchik, Frank—Bridgeport; Jefferson Medical College, 1927. Dr. Turchik developed the specialty of plastic and maxillo-facial surgery into a recognized field. Dr. Turchik introduced the specialty in St. Vincent's where he was a resident specialist.

In 1935, Dr. Turchik was given an appointment in plastic surgery and in 1941, in bronchoscopy in reference to tumor work and in determining cancer in the broncho areas in St. Vincent's hospital.

Dr. Turchik was president in 1953 of St. Vincent's medical staff; 1957, Bridgeport Medical Association; and 1960, New England Otolaryngology Society. Dr. Turchik was a Fellow of the American College of Surgeons; a diplomate of the American Board of Otolaryngology, and a director and charter member of the American Otorhinology Society for Plastic Surgery. Dr. Turchik was a Fellow of the American Academy of Ophthalmology and Otolaryngology and the American Laryngological, Rhinological and Otological Society. He was listed in "Who's Who in the East," "Who's Who in New England," and "American Men of Medicine." Dr. Turchik was a member of the New England Otolaryngologic Society, the Bridgeport Medical Association, the Fairfield County Medical Association, the Connecticut State Medical Society, and the American Medical Association. Dr. Turchik died January 12, at the age of 59.

OBITUARY

Herman C. Little, M.D.

1884-1963

On January 6, 1963 Herman Little, who resided at 171 Santa Fe Avenue, Hamden, Connecticut, died suddenly and unexpectedly. He was born July 25, 1884 at Manchester, the son of Prescott and Lida Ford Clark Little, graduated from the Yale School of Medicine in 1910, and after his internship at the New Haven Hospital he spent two years with Yale in China. On his return from China he did general practice in Stonington, where he also was medical examiner, and in 1917 he moved to Willimantic and became physician and surgeon at the American Thread Company and attending physician at St. Joseph's Hospital.

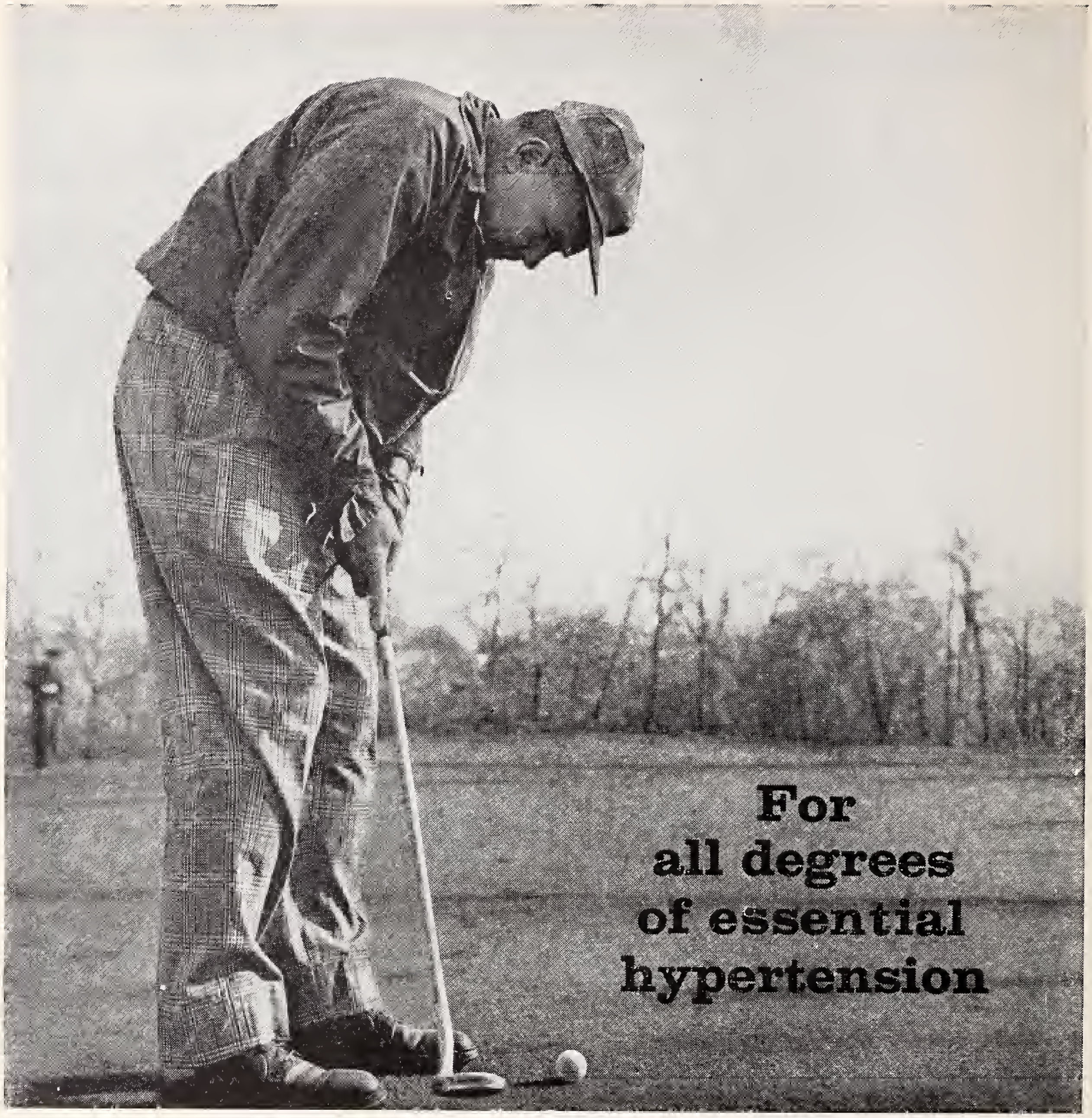
In 1926, Dr. Little became assistant in ophthalmology at the New York Post Graduate Medical School and after two years of intensive study he returned to practice in New Haven in affiliation with the well known ophthalmologist Dr. Eugene M. Blake. In 1934 he became a diplomate of the American Board of Ophthalmology.

He was assistant attending surgeon at the Grace-New Haven Hospital and assistant clinical professor of ophthalmology at the Yale School of Medicine. He was a member of the New Haven County and New Haven City Medical Associations, the Connecticut State Medical Society, the Connecticut State Eye, Ear, Nose and Throat Section, the American Medical Association and the Yale Medical Alumni Association. He was also a member of the New Haven Country Club, the Graduates Club, Yale Faculty Club, deacon of the Edgewood Congregational Church, and a member of the Society of Mayflower Descendants.

Dr. Little was well liked by all his colleagues, by his friends and his patients, for he was a humble and forthright man. He will be missed by many people.

He is survived by his widow, Agnes Moore Little, and two sons, H. Foster of North Haven and William B. of San Francisco, and one brother Joseph P. Little of Pontiac, Michigan.

Jacob Nodelman, M.D.



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†Hutchison J. C.: Current Therap. Res. *2*:487 (Oct.) 1960.

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NEW BOOKS IN REVIEW

A RORSCHACH READER. Edited by Murray H. Sherman. Foreword by Ruth L. Munroe. 440 pp., $7.50.

Reviewed by: LOUIS H. NAHUM

In 1921, a young Swiss psychiatrist, Dr. Hermann Rorschach published a modest volume "Psychodiagnostik" in which are given methodology and results of a perception diagnostic experiment. He asked his patients to interpret what they see in blots of ink which had no precise picture. The patient would then interpret what he saw and in these interpretations he projected his own fantasies in response to these ink blots. These deeply meaningful data were secured from the unconscious needs, fears, aggressions of the patient. The responses are carefully scored and interpreted in the light of the experiences of many investigators over a number of years. But to interpret the true meaning of the test it was necessary to be fully conversant with the contribution of psychoanalysis to human psychodynamics.

In addition, the Rorschach can give cogent data concerning intelligence which does not depend on the usual old fashioned type of I.Q. test. It led to revamping of intelligence tests in several forms. In fact knowledge of the Rorschach is almost as much a requirement today for the psychologist who "tests" people as knowledge of intelligence and aptitude tests. There is, however, a difference between the standardized and the projective tests. The former reduce the examiner to a minimum. The latter depends on the insight of the tester. This in turn depends upon a general grasp of psychodynamics, the examiner's experience, and the experience of his colleagues. It is this latter which are offered in this book. Here the test is not so much a test as it is a tool for research and psychological understanding. There are papers here that make a contribution to psychological knowledge and in formulating significant questions. Wide reading such as this book affords is a real safeguard against a narrow "test" approach. Here the expert and the beginner will find significant material in the articles but also in the specialized bibliographies. If the Rorschach is handled objectively on the basis of statistically treated scores, the findings are easy to communicate but little comes out about the patient's personal problems. If it is interpreted in terms of involved emotional conflicts the communication between "tester" and psychiatrist becomes more difficult because there are a wide variety of responses and a wide variety of Rorschach reports.

Rorschach may be viewed as an extremely valuable way of studying how patients vary in their perceptions, how psychologists vary in their interpretation of perception and how therapists vary in their ability to communicate and accept meanings and values differences from their own.

If one evaluates a patient by just the Rorschach test alone he may be adjudged psychotic but in the last analysis the character of the person is best revealed by what he does and how he does it in a real life situation. A person with a normal Rorschach may be most unproductive both to himself and his fellowmen. The artist, the scientist with so called abnormal Rorschach may make major contributions to society. Because of the complexities of the human mind, there can be no single one to one relationship between a test and human behavior.

The book is intended as a collateral reading test for Rorschach courses and as a source book for professional workers. The book is composed of five sections; Rorschach findings in Psychopathology, Rorschach findings and vocational choice, Rorschach findings among other cultures, Experimental use of Rorschach, Interpretation of test results.

Clinicians and Research Psychologists conversant with the basic assumptions and inferences of this far reaching projective technique will enjoy this authoritative volume. There is in it the varying symptoms complexes which the test has helped to describe and understand. There is revealed how much Freudian theory and practice have contributed to the interpretation of these versatile ink blots. It would certainly appear that no large scale investigation of human responses before and after a deliberately induced experimental brain change could be in any way complete without the kind of data which may be secured by experts interpreting these ink blots.

Anyone who searches for hidden sources of illness in mentally disturbed patients will obtain surprisingly valuable insight from the ink blot test. At the same time it must be emphasized that all clinical data secured by a good patient's history, clinical examination by a competent psychiatrist and analyst are crucial to the understanding of a mentally ill person.

PROBLEMS OF PULMONARY CIRCULATION: Study Group No. 8. Ciba Foundation, Little, Brown & Co., Boston, 1961, 96 pp., $2.50.

Reviewed by: LOUIS H. NAHUM

This little book is in honor of Professor G. Liljestrand, a noted Swedish physiologist, who did much to expand our knowledge in pulmonary physiology, muscle physiology, cardiac output and pulmonary circulation.

The opening remarks by Dr. Andre Cournand are somewhat autobiographical and philosophical. Here we learn how a study of respiratory physiology by Knipping impressed Cournand's chief, James Alexander Hiller, who put him to work with Dickinson Richards in a study of the physiopathology of pulmonary diseases. His belief that clinical physiologists should make observations which should then be analyzed by the experimental method expresses his philosophy of the relation between clinical and experimental science.

There are twenty-five outstanding scientists who contributed six basic papers and these are followed by a general discussion and the Chairman's closing remarks.

The basic papers are Radiological assessment of pulmonary arterial and pulmonary venous pressure; Regional pulmonary blood flow in mitral and congenital heart disease; the functional aspects of pulmonary hypertension; the nervous control of the pulmonary circulation; Experiments on pulmonary circulation and gas exchange; the effects of varying oxygen tension and of acetyl-choline in the human pulmonary circulation.

The Ciba Foundation is set up for the promotion of international cooperation in medical and chemical research. The excellent books that have come out of such collaboration attests to the wisdom and broadmindedness of the idea and the success with which it has been put into practice. There are no east-European scientists in this symposium and it will not be clear to the reader whether no great pulmonary physiologists exist in this large segment of the scientific world or whether they would not contribute to the variety of points of view. As the chairman stated in his concluding remarks "It is not so important in a meeting of this sort that agreements should be reached on all subjects, but that a variety of points of view should be presented." But science is continuous and without doubt scientists will continue to work, devise new experiments and modify hypotheses accordingly. But pulmonary physiology has gone a long way since Cournand and Richards teamed up in the 30's, and the volume reveals both the progress and the unsolved problems that exist today.

CEREBRAL VASCULAR DISEASE: Transactions of the Third Conference held under the Auspices of The American Neurological Association and The American Heart Association. Princeton, New Jersey. January 4-6, 1961. Clark H. Millikan, Robert G. Siekert, and Jack P. Whisnant, Editors, Grune and Stratton, New York, 1961, 247 pp.

Reviewed by: LOUIS H. NAHUM

There were fifty-six participants, many of national and world stature in the field of vascular disease, neurology and vascular surgery. The immediate planning committee was Dr. Irving Wright, Dr. Denny-Brown, Dr. Harold Wolff, Dr. Michael DeBakey and Dr. Fletcher McDowell. The area to which this conference was limited was ischemic cerebrovascular disease and covered incipient or impending strokes (focal intermittent insufficiency or ischemic attacks), progressing stroke and completed stroke. The most dramatic change that is brought out in this symposium is that now there is full realization of the importance to cerebrovascular accidents of vascular disease outside of the head. Amazing skill and know-how has resulted in safe operative therapy. What we do not know is how many such people would have improved spontaneously without such intervention.

We do know, however, that many patients have been conducted to a better way of life through their vascular illness. But to succeed in vascular surgery a striking change had to take place in the technique of arteriography with introduction of the material much lower to show the arteries in the chest. Also, the procedure must be accompanied by readiness for immediate operative intervention because of the hazards inherent in the diagnostic procedure. This means more trained personnel because it cannot be left into the hands of a general surgeon.

Anticoagulation came in for some searching questions. It was pointed out that the coumarin derivatives in some cases produce cerebral anoxia and hypertensoin. This complication should always be looked for and act as a red light warning against the further use of such agents. However, they must be reduced slowly because of the hypercoagulable state that follows which may actually produce a stroke.

The conferees were generally agreed that a patient with a completed stroke is the least encouraging prospect for therapy. The chances for spontaneous recovery are great in this group, but if they do not improve spontaneously neither anticoagulants or surgery will help them. As regards subsequent vascular accidents and duration of life span there is still debate.

The defect of the progressing or evolving cerebral vascular accident may possibly be modifiable but half of these patients do quite well spontaneously as regards recovery if effects of the stroke are not very severe. An explanation of the recurrent ischemic attacks as being due to thrombi which spontaneously dissolve because of hightened fibrinolytic activity of the blood seemed a very rational one. At any rate they felt that a better definition of the syndromes especially the transient ischemic group was very much desired.

The additional knowledge necessary before we can speak optimistically about stroke therapy was considered. One would be a safe readily applicable painless method of measuring cerebral blood flow especially flow that is locally altered. This could help in prevention of cerebrovascular disease and in definite therapeutic steps that could be taken. Another area for surgeons to explore are the vessels inside the head where now it is impossible to modify the circulation. Conventional anticoagulant therapy must be improved with new methods and new agents, especially since those now in use can affect the metabolism of the neurons and lead to hypertension. We need much more knowledge about atheromatous and thrombotic processes.

Dr. Wolff ended up by saying that if anticoagulant therapy as a method of protecting those who have had cerebrovascular accidents were to be widely practiced, great disappointment would follow. If general surgeons would start doing procedures for vascular disease in the upper chest and neck it would be a catastrophe and discredit the good work already done.

As usual, with all symposia all agree that many future meetings will be needed to redefine the problems in the light of fresh experiences.

Problems In The Administration Of An Exemplary Arthritic Clinic In A Teaching Center

By E. P. Engleman, Ethelyn Sellinger and Stacy R. Mettier
Arthritis and Rheumatism Vol VI: 78, 1963

Arthritic diseases are receiving more attention today and funds are available in greater amounts than ever before which is encouraging many community hospitals to provide arthritic clinics.

While this short article is primarily written for the guidance of those who are concerned with a medical school teaching hospital clinic, there is so much of value for any group seeking to set up an arthritic clinic that it can be read with benefit and many mistakes avoided.

Denis S. O'Connor, m.d.

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Connecticut Medicine

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Robert I. Lowenberg **Transosseous Phlebography In Diagnosis And Treatment Of Phlebitis**

Frederick J. Christie **Familial Idiopathic Hemochromatosis**

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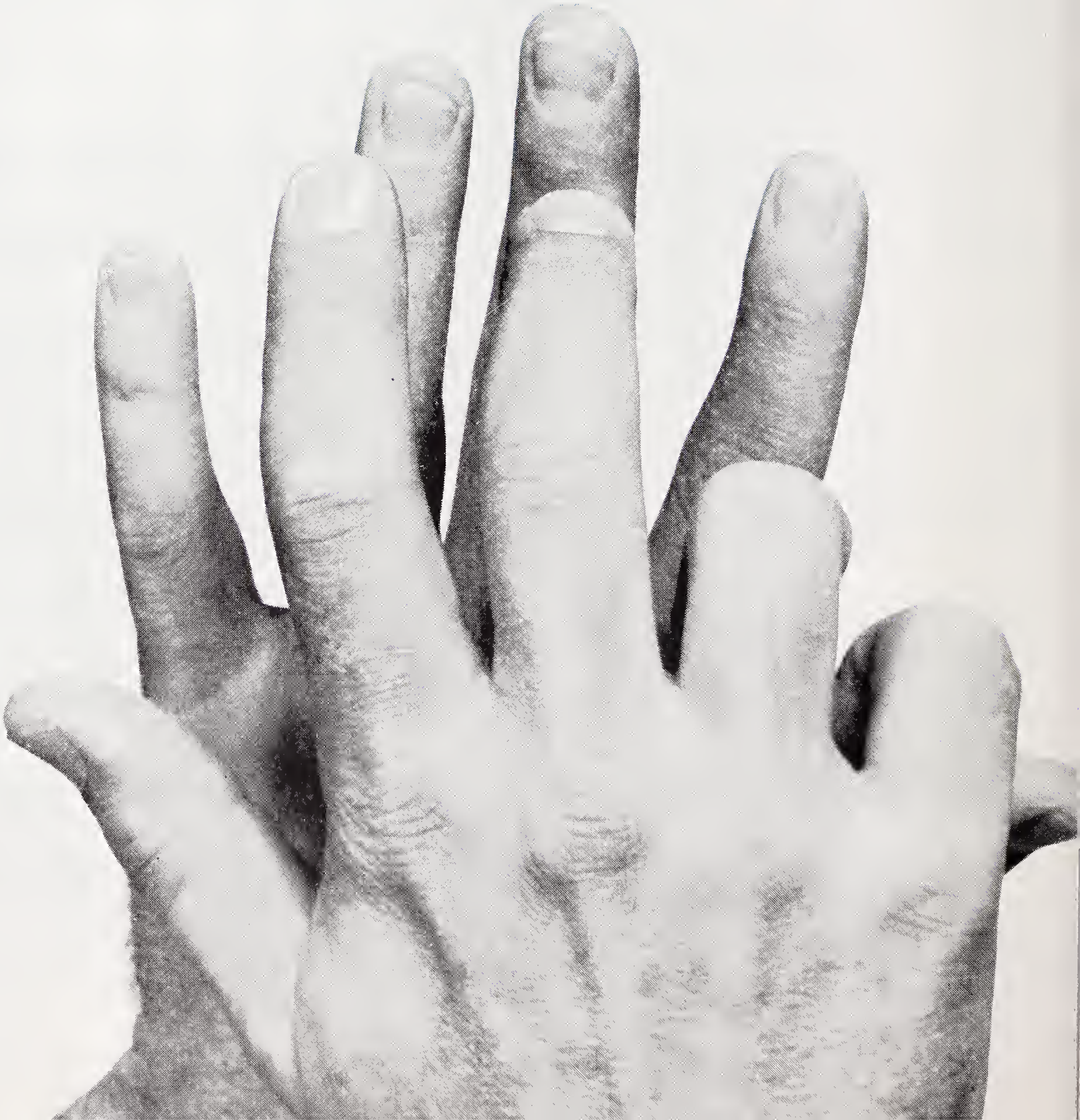

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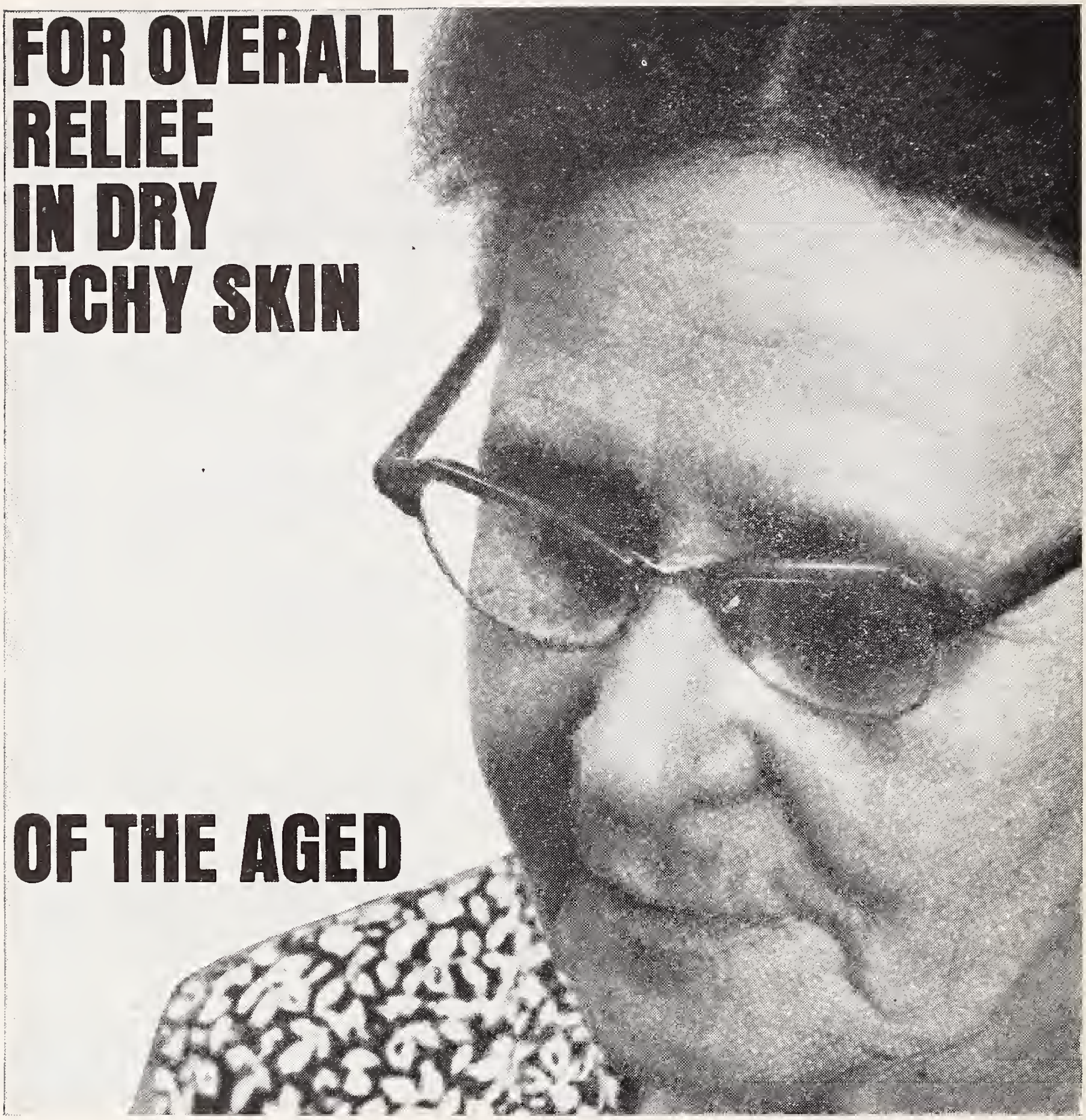
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Transosseous Phlebography In Diagnosis And Treatment Of Phlebitis

Complete Simultaneous Bilateral Lower Limb Phlebography

Robert I. Lowenberg, m.d.
New Haven

Introduction

Thrombophlebitis and the post-phlebitic syndrome present the same problems that they did many years ago. Early and complete diagnosis of phlebothrombosis and thrombophlebitis is still a great challenge even to the most astute clinician, and death from pulmonary embolism continues at an alarming rate.[1] The most upsetting factor is that a very high percentage of fatal pulmonary embolism occurs in patients who had not been suspected of having any type of venous thrombosis.[1]

A more thorough understanding of the clotting mechanism and the fine distinction line between thrombophlebitis and phlebothrombosis may prove of great value.[2] At present, the two are thought to be the same condition in different stages and appear to coexist in many patients. The asymptomatic phase, phlebothrombosis, in which nonadherent clot is present, is the one to be feared most. In 1954, the Sphygmomanometer Cuff Pain Test was introduced by the author.[3] The use of this test as part of the routine history and physical examination upon entrance to the hospital, followed by its use on ward rounds in post-operative and desperately ill patients will aid in detection of early cases of intravascular clotting. In ambulatory patients with swollen or painful extremities, it has proven a helpful diagnostic aid. With the aid of the Cuff Test, diagnosis of occult phlebitis may be made days or weeks before[3] the clinical picture becomes obvious. This allows the physician time for confirmatory examinations as well as the institution of treatment prior to the onset of serious complications.

In the patients suffering with the postphlebitic state, urgency is not a problem. Such people have chronically swollen, painful legs. Brawny induration, secondary varicose veins, and ulceration complete the picture. A host of treatments are in use; a glance at the list shows that no measures are a guarantee of cure.

The physician challenged with massive swelling associated with acute phlebitis and certain types of chronic phlebitis welcomes methods of obtaining further information as to the patency of the deep and communicating vessels. Phlebography performed by per venous injection, has been used by many but the resultant information has not always been helpful or reliable, because of lack of complete filling or inconsistency of filling.[4] Phlebograms have been difficult to repeat and lack of filling cannot be depended upon to indicate obstruction of venous channels. More reliable information may be obtained by using the transosseous route for injection. This approach has been used more extensively abroad than in this country.[5, 6, 8, 7]

Technique

The technique is simple. A thorough Phisohex prep is done as for a surgical procedure. One hour prior to injection, the patient is given one million units of aqueous procaine Penicillin as a prophylactic against infection or osteomyelitis; this is probably not essential but has been used as a precaution. For premedication, a barbiturate and an antihistamine drug are used to reduce sensitivity reactions. The patient is tested with one drop of contrast dye in the conjunctiva and three minutes later with 0.1 cc. intravenously. For the contrast studies, we have used 50 per cent Hypaque.*

---

*Hypaque-sodium 3, 5 diacetamido-2, 4, 6 triiodobenzoate.

Dr. Robert I. Lowenberg is assistant attending surgeon, Grace-New Haven Community Hospital, Memorial Unit; consultant, vascular surgery, Meriden Memorial Hospital; Veteran's Hospital, Rocky Hill; Connecticut State Valley Hospital, Middletown; courtesy staff, St. Raphael's Hospital.

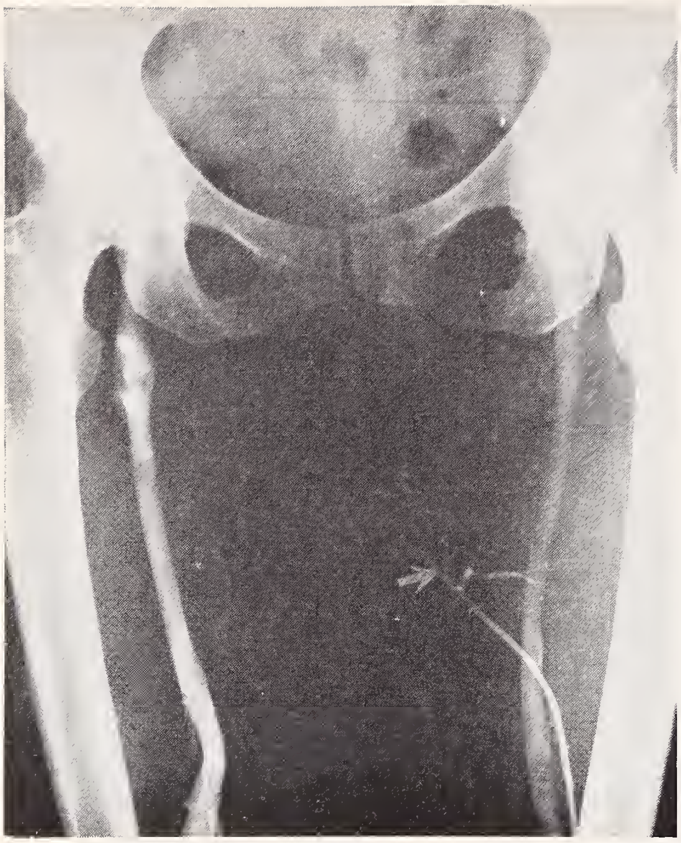

FIGURE I

Bilateral simultaneous transosseous phlebography through tibial tubercles. Arrow indicates left saphenous vein and a very heavily filled tributary. On right, dye is concentrated within cusps of valve at saphenofemoral junction. This is essentially a normal phlebogram.

The areas to be used are scrubbed with aqueous Zephiran solution and draped with sterile linen. Local or shortacting general anesthesia is used, usually sodium pentothal, and a bone marrow needle passed into the marrow space. Aspiration is done to verify the location of the needle tip; marrow blood will be aspirated. The needle is connected to an adapter and tubing and the dye injected briskly. A dilute solution of Heparin is helpful in preventing clotting in the marrow needle, if more than one injection is contemplated.

Routine skeletal technique is used but with a filter over the less dense part of the extremity, as indicated. A modification of this technique employs two x-ray tubes; a portable machine is placed over the lower part of the extremity; a lead shield is used to prevent double exposure. This technique is feasible because extreme speed is not necessary and the needle can usually be placed sufficiently distal to the part under study to avoid interference with the lead shielding.

A 14″ x 36″ cassette allows for simultaneous exposure of both entire lower limbs. Films are exposed as the injection is being completed and as soon thereafter as a normal change of films will allow; (rapid cassette changers are not required.) After viewing the films, alteration of injection technique or of exposure timing may be modified to give the best desired result. An injection mass of twenty cubic centimeters of dye gives excellent filling and the entire procedure may be completed in thirty minutes. The addition of a Y-connector to the apparatus and the use of a second bone marrow needle make it possible to study both limbs at one time, from ankle to groin. This method of study has been found especially valauble.

Results

The above technique has been used in eighteen personal cases with five being done through the greater trochanter, seven through the calcaneous, one through the iliac crest, one through the spine of a lumbar vertebra and four through the internal or external malleoli.

In addition to this, there are a number of house cases which were done using the same technique. This series was done without any complication whatever. There was neither morbidity nor mortality within this series. In addition, there were no

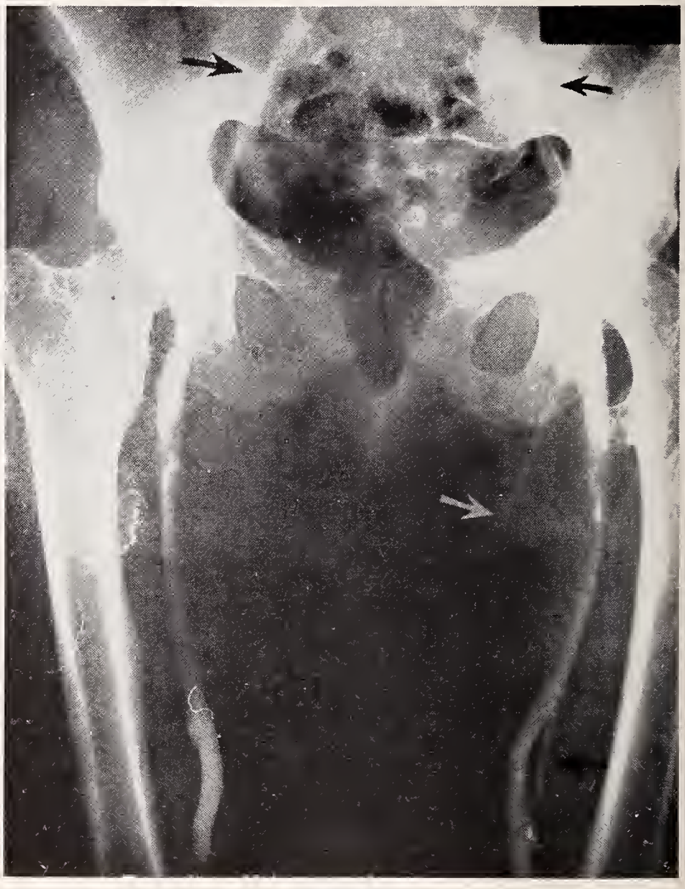

FIGURE II

Bilateral simultaneous transosseous phlebograms through tibial tubercles. Partial reduction of femoral flow at mid-thigh shown on left. White arrow shows left saphenous vein. Lower black arrow shows a communicating vessel to the deep system. Upper black arrows show normal course of iliac veins.

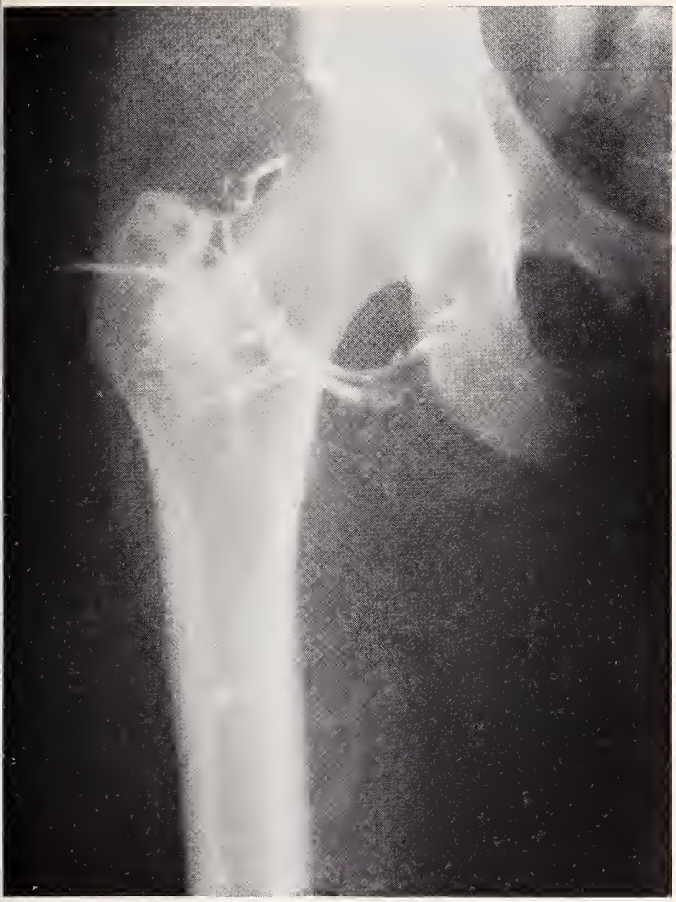

Figure III

Transosseous phlebogram through greater trochanter. Good filling of the external iliac vein through the collateral vessels is seen. Femoral vein filling is minimal and seen inferior to femoral triangle in a case of surgical interruption of the femoral vein for thrombophlebitis.

complications to our knowledge in any of the house cases done by the same technique.

Following injection of the contrast medium, the dye passes rapidly from the marrow spaces directly into the deep venous channels. Because of this direction of flow, lack of filling of the deep venous system indicates block in this compartment. Most transosseous phlebograms show sparse filling of the superficial vessels. Areas of partial and complete block may be sharply defined and those of increased collateral supply or of an incompetent valvular system may be demonstrated readily.

There are many advantages of bilateral simultaneous complete limb phlebography. All the technical factors which make for problems in interpretation when the two limbs are taken separately, or when only part of one limb is visualized are eliminated. These factors include: X-ray technique, film variation, development factors, timing, and injection pressure. The only difference in the visualized filling of the two limbs is within the veins themselves and this permits easier interpretation.

In extensive and acute venous occlusion, the decision to perform a Mahorner thrombectomy[8] as well as the selection of the proper level for phlebotomy may be simplified by a study of the transosseous phlebograms. The following case reports illustrate the use of this technique along with surgical intervention.

CASE REPORTS

Case No. 1

W.W., a white male patient, seventy-five years of age was first seen on August 15, 1956, at which time he complained of swelling of his right foot of two weeks duration. Two days prior to examination, he had noted a sudden onset of pain and massive swelling of the entire lower limb to the groin. He was admitted to the Grace-New Haven Community Hospital where a transosseous phlebogram was performed through the right iliac crest. The dye was seen to pass through collaterals of the right common iliac vein and through the pelvis to the left extremity and left external and common iliac veins. (Fig. 4) This confirmed the diagnosis of thrombosis of the right common and external iliac, and femoral veins.

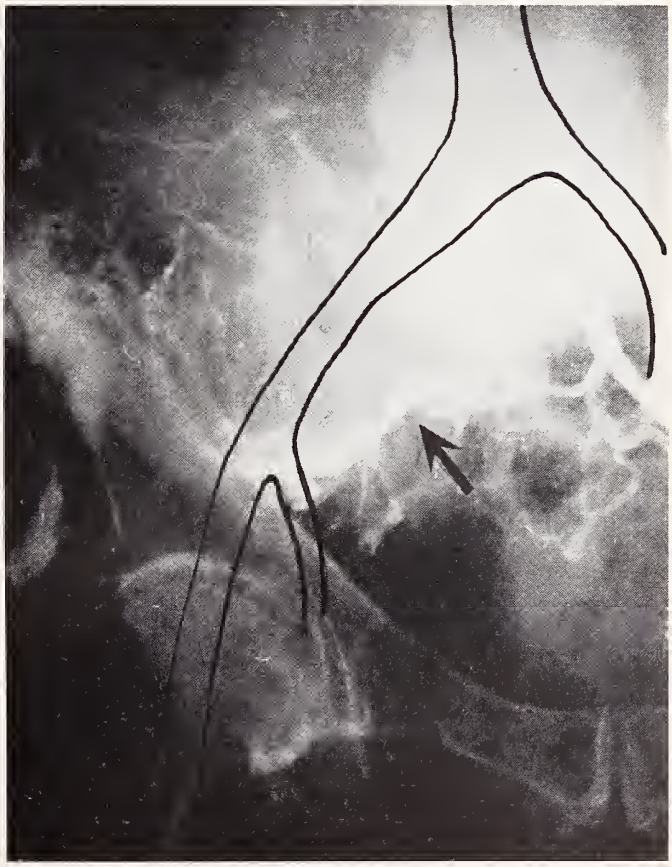

Figure IV

Transosseous phlebogram through iliac crest. Ipselateral femoral and iliac veins are blocked. Filling of vessels of contralateral side by anastomoses shown at arrow. Superimposed drawing of course of normal iliac vein and lower end of vena cava. (Case No. 1).

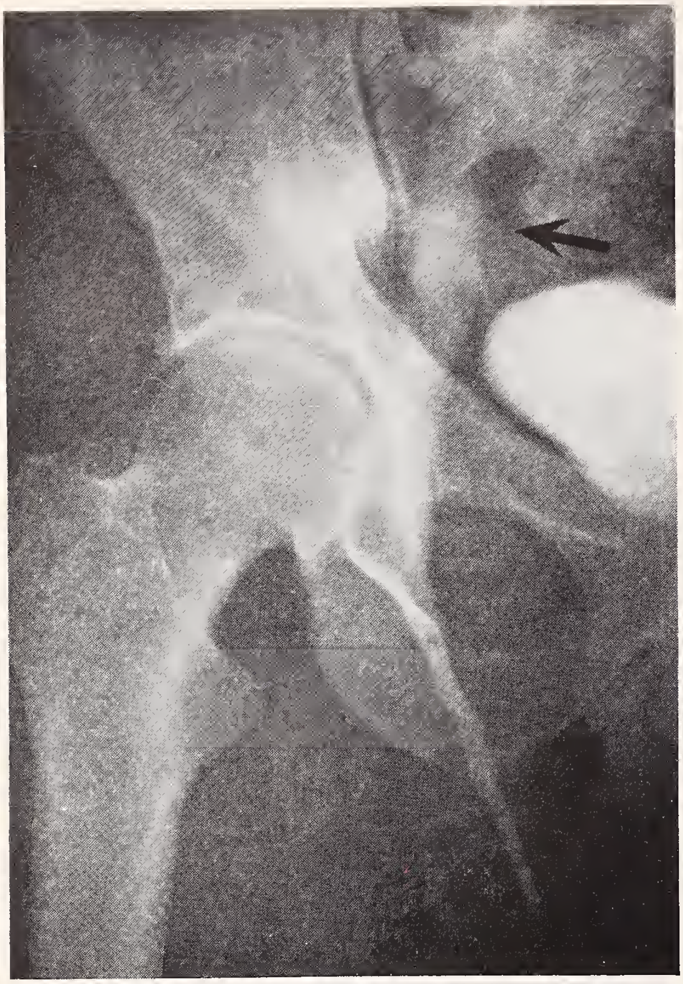

Figure V

Transosseous phlebogram through medial malleolus. Saphenous and external iliac veins filled; arrow indicates level above which partial block is present in external iliac vein. Femoral vein failed to fill.

The patient was taken to the operating room where the right common and superficial femoral veins were exposed and were found to be thrombosed. A longitudinal incision was made into the right common femoral vein. A partially organized soft, dark red clot was found. Using Penrose tapes about the proximal and distal vein, the clot was extracted with a Blake gallstone forceps and by aspiration proximally and distally. Most of the clot came from the proximal segment. Brisk bleeding occurred from both directions at the completion of the procedure. The phlebotomy wound was closed with a Carrell stitch of 4-0 atraumatic vascular silk. The thigh wound was closed with interrupted 4-0 silk sutures; a polyethylene catheter was inserted into the great saphenous vein at the ankle and the patient was Heparinized with approximately 200 mg. of Heparin-Sodium per 1000 cc. 5 per cent glucose in water. An arm clotting time of fifteen to twenty minutes was maintained for four days. Swelling subsided rapidly and ten days post-operative, the phlebogram was repeated and showed the patient's external and common iliac veins on the right side to be patent. At that time only a trickle of dye entered the veins on the left side of the pelvis. Complete limb rehabilitation was accomplished.

Case No. 2

E.S. was sixty-seven year old white male patient who sustained a fractured right hip in 1914, with no reported sequelae and a second right hip fracture in 1941, resulted in a stiff joint. After this, the patient had intermittent swelling, dermatitis and ulceration of this extremity, but this was not incapacitating. In September, 1954, he suffered a direct but minimal trauma to the skin of the right shin. Prompt exudative dermatitis resulted and a large persistent ulcer developed at the site of trauma. After weeks of conservative treatment at the Hospital of St. Raphael with elevation of the foot of the bed, complete rest, local applications, etc., the condition of the skin was sufficiently improved to allow ligation of the right great saphenous vein with stripping, excision of the ulcer and skin grafting. Healing was good and with only slight delay. Ambulation and discharge from the hospital, however, were followed by a new bout of dermatitis and ulceration which resisted treatment. A Homan's procedure was done with extensive ligation of perforators. Healing was complete after about four weeks, but repeated attacks of ulceration followed this patient's discharge from the hospital.

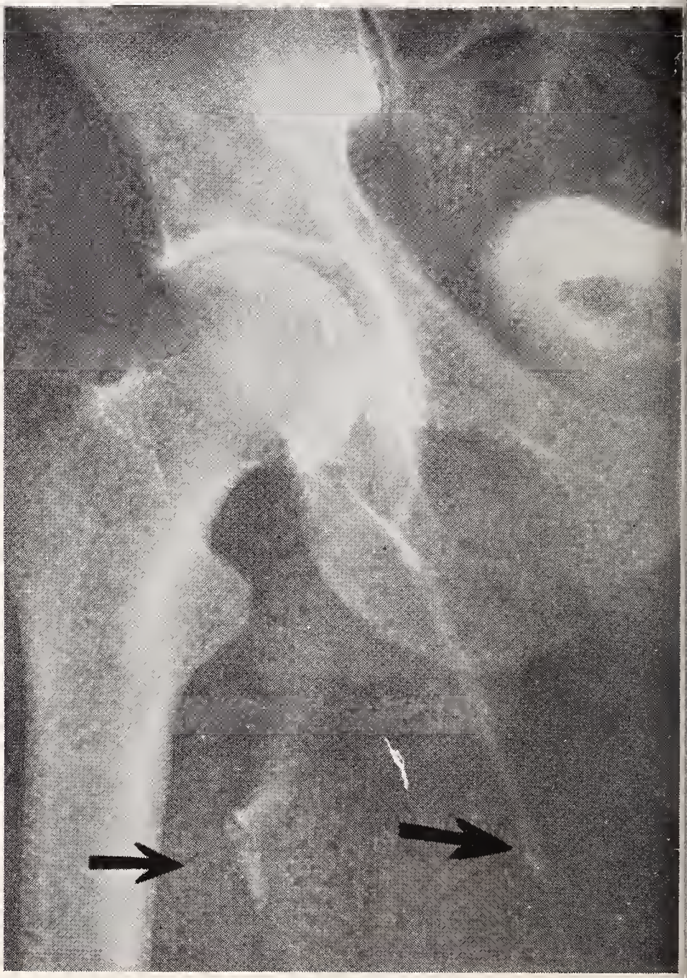

Figure VI

Same case, delayed film, taken in partial foot-down position, showing partial retrograde filling of femoral vein. Lateral arrow shows valve cusps in profunda; medial arrow shows valve in saphenous vein. Case of postphlebitic syndrome involving femoral vein.

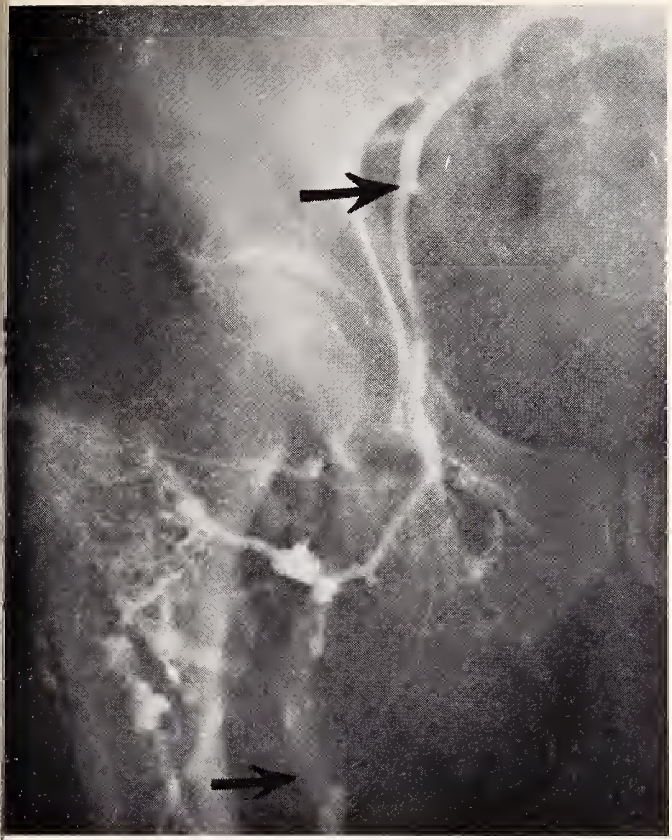

Figure VII

Transosseous phlebogram through greater trochanter. Extensive filling of collaterals about femoral and external iliac veins demonstrates the deep and superficial pelvic plexi. Femoral (lower arrow) and iliac veins very lightly filled. Upper arrow indicates block in hypogastric vein. Case of iliofemoral thrombophlebitis.

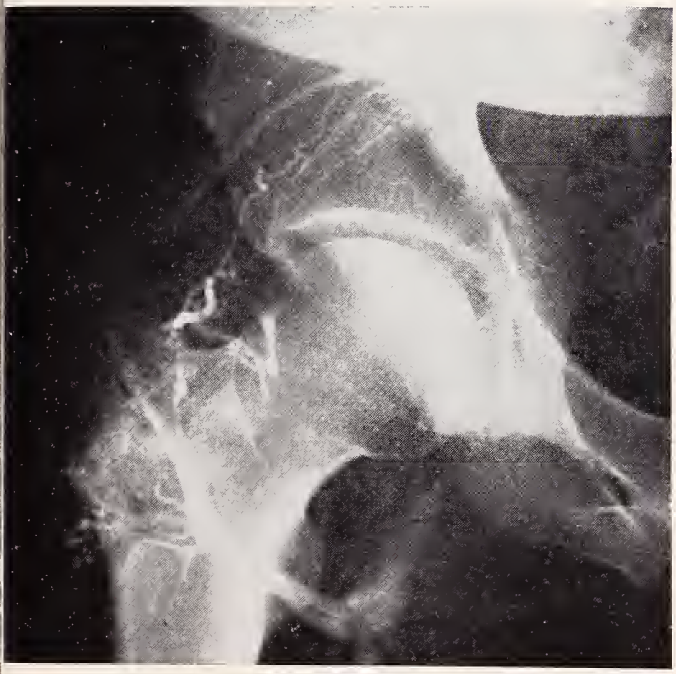

Figure VIII

Transosseous phlebogram through greater trochanter. Contrast dye is seen to enter femoral vein through circumflex tributary. Femoral lumen distorted by previous thrombophlebitis which also damaged the valvular system.

Transosseous phlebography was performed on August 30, 1956, using the medial malleolus. There was excellent filling of the popliteal and femoral veins. The phlebogram revealed enormous dilatation of the popliteal vein with disorganization of the valvular system. (Fig. 2) As a consequence, the popliteal vein was explored, ligated, and divided. Post-operative transosseous phlebograms through the calcaneous showed complete occlusion of the popliteal vein with dye passing proximally through an overlying collateral vessel. Post-operatively, there was healing of the lesion but with breakdown approximately twenty-four months later.

Case No. 3

J.B. was a forty-two year old slim, white male patient at the Connecticut State Hospital in Middletown suffering from extensive swelling of the right lower limb of sudden onset. The patient complained of pain in the right lower extremity, which proved to be the site of an extensive iliofemoral thrombophlebitis. Evidence of similar involvement of the unsuspected limb was detected with the aid of the Sphygmomanometer Cuff Pain Test. The patient was treated with anticoagulants. A short time following cessation of anticoagulant therapy, a new bout of thrombophlebitis occurred. There were several other bouts of a migrating type of

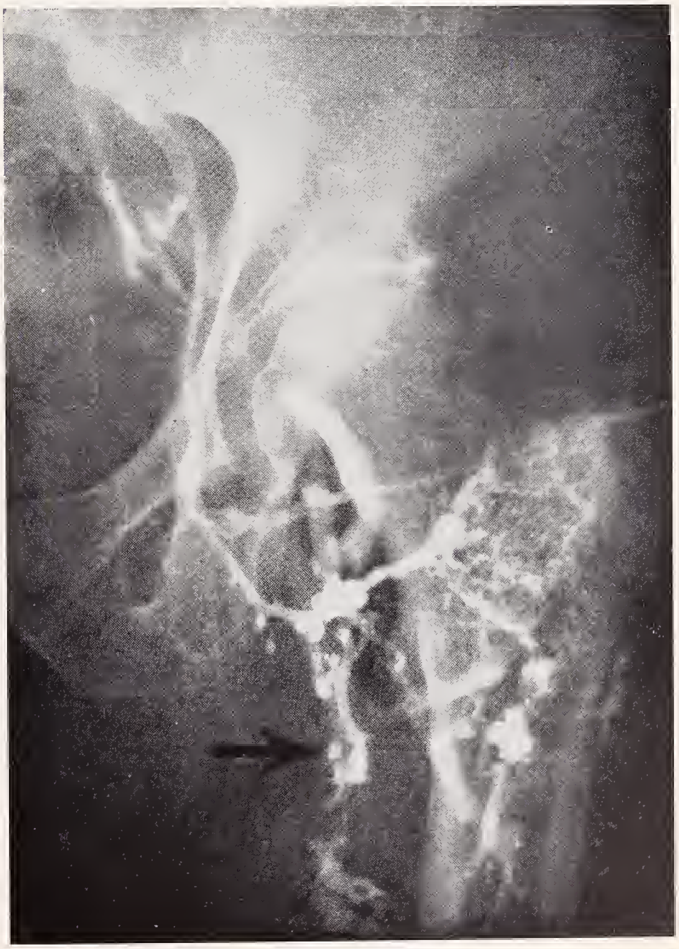

Figure IX

Transosseous phlebogram through greater trochanter shows extensive dilatation of collaterals about the hip with common femoral vein obstruction. Arrow indicates anatomical course of femoral vein. (Case No. 3).

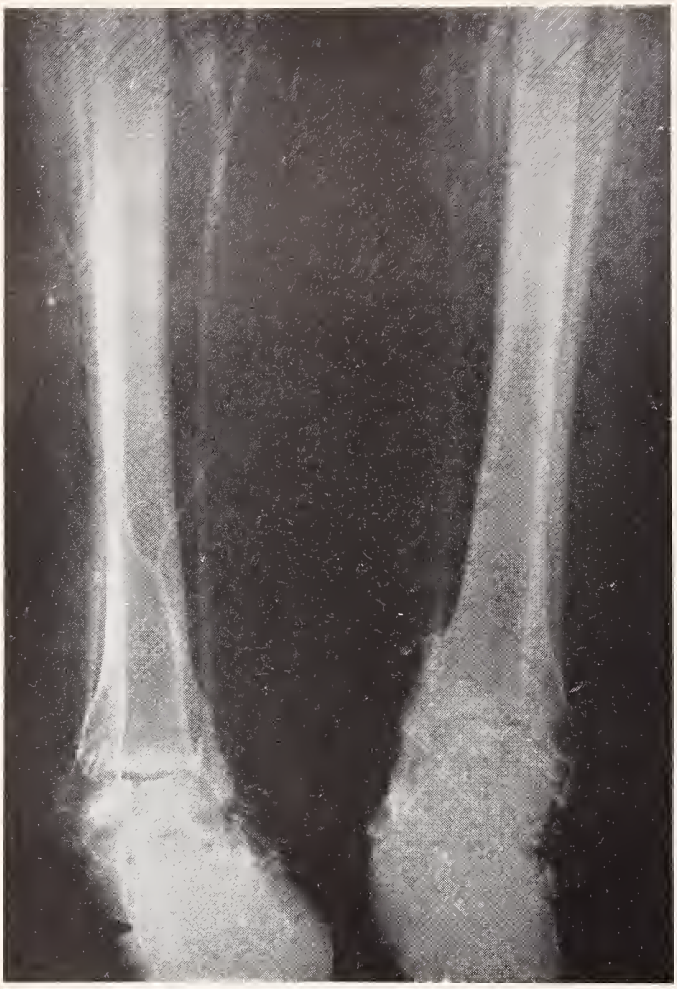

Figure X

Bilateral transosseous phlebogram through calcanei. Relatively increased superficial system filling indicates deep vessel obstruction. (See text).

thrombophlebitis. Transosseous phlebography demonstrated deep venous pathology of a diffuse nature as seen in Figure 9. This patient was later found to have a carcinoma of the lung which metastasized to the axial skeleton and skull.

Discussion

Phlebography plays an important role in the management of the complicated case of the postphlebitic syndrome. Radiographs made by the transosseous method are easy to interpret because artifacts are minimized. Reliability of interpretation is far greater because the contrast dye in the bone marrow drains directly into the deep venous system.

Transosseous phlebography has additional advantages. There is no need for venipuncture, venous catheterization, or venous interruption. Postphlebogram phlebitis is, therefore, avoided; the procedure can be done swiftly with small amount of contrast dye under local or general anesthesia. No tourniquets are needed, the use of which is contra-indicated, in the presence of active inflammation or intravascular clot. A tilt table is not needed nor is the use of the sitting or standing positions. Results can be reproduced accurately, and repeated readily.

The method may be utilized to delineate venous drainage from pelvis, long bones, axial skeleton, pectoral girdle, ribs, body wall, etc. It is also useful in delineation and diagnosis of benign and malignant tumors, and to demonstrate large vessels within the inaccessible body cavities.

In our series, this technique has been used many times without any untoward results. Excellent pictures have been obtained using iliac crest, greater trochanter, tibial tubercle, the malleoli and the calcaneous as injection sites. Neither osteomyelitis, air embolism, nor fat embolism have been encountered, although they all must be kept in mind and guarded against. Air embolism may be prevented by removing all air bubbles and insuring the absence of all leaks from the tubing. Local anesthesia may

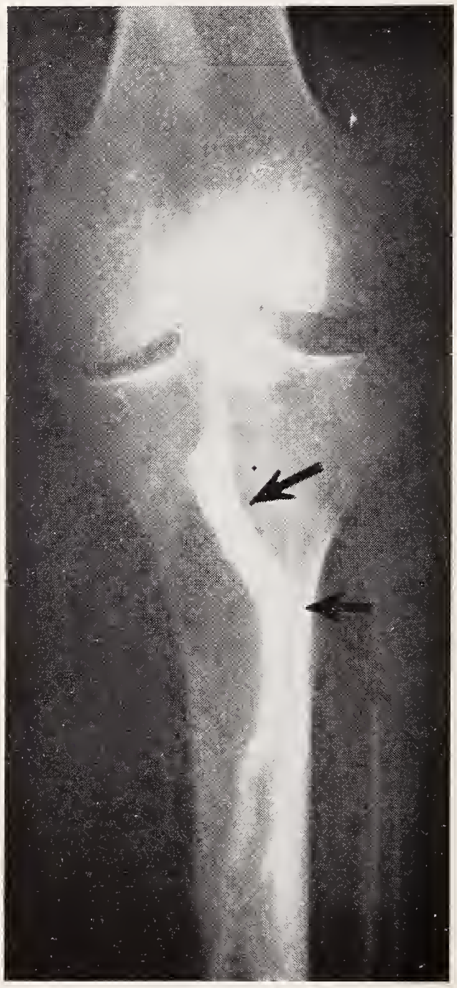

Figure XI

Transosseous phlebogram through the medial malleolus. Gross distortion of the popliteal vein is seen with disorganization of the valvular system (upper arrow) and reduced flow into the femoral segment. At lower arrow, obstruction at peroneal branch is noted. Inferiorly, a markedly dilated posterior tibial vein can be seen. (Case No. 2).

be used but sodium pentothal is preferable as the injection is somewhat painful. Pain may result in limb movement thus producing distortion on the films. Injection under mechanical pressure should provide even better radiographs and attempts in this direction are to be encouraged.

Summary

1. The role of transosseous phlebography in the diagnosis and treatment of the phlebitic states is described with three representative case reports.

2. Typical transosseous phlebograms are displayed to demonstrate the anatomy and pathology.

3. Transosseous phlebography is technically simple; there are few precautions. Bilateral, simultaneous, complete lower limb phlebograms have proven most informative and conclusive.

4. The method is excellent for the demonstration of venous drainage from the bones, for the visualization of deep seated and inaccessible venous pathways, as well as for the demonstration of intravascular occlusion, valvular pathology, and pathologic filling.

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In the night of Easter, Saturday 1921 I awoke, turned on the light and jotted down a few notes on a tiny slip of paper. Then I fell asleep again. It occurred to me at six o'clock in the morning that during the night I had written down something most important. I was unable to decipher the scrawl. That Sunday was the most desperate day in my whole scientific life. During the next night, however, I awoke again at three o'clock, and I remembered what it was. This time I did not take any risk; I got up immediately went to the laboratory and made the experiment on the frogs heart . . . at five o'clock the chemical transmission of nervous impulse was conclusively proved.

—Otto Loewe, *From the Workshop of Discoveries,*
Porter Lectures, University of Kansas Press, 1953.

Familial Idiopathic Hemochromatosis

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Hemochromatosis has long been known to be a disease of iron metabolism characterized morphologically by abnormal hemosiderin deposits in the liver, pancreas, heart, skin and other viscera and clinically by diabetes, cirrhosis of the liver, heart failure and bronzing of the skin. The diagnosis is easily made in the presence of the fully developed symptom complex and substantiated by appropriate biopsy. When typical symptoms are lacking the diagnosis becomes extremely difficult. Early diagnosis is particularly important now that it has been shown that both symptoms, physical signs as well as morphological evidence of this disease can be improved by repeated phlebotomies.[1,7] The occurrence of Hemochromatosis in certain families has been reported in literature more frequently in the recent past.[1-7] It has been estimated that about one per cent of Hemochromatosis is of the idiopathic familial variety.[8] It is with this aspect of the problem that the following case report is primarily concerned.

P.B.: a forty-year old white, married lawyer entered the Greenwich Hospital on 12/8/61 with chief complaints of dyspnea, abdominal swelling and edema of his legs of two weeks duration. He was well until 1952 when he noted the onset of impotence, azospermia, and gradual atrophy of his testes. In 1958 he had the onset of progressive muscular weakness, however, he was able to carry on his work until March of 1961 when it became very difficult for him to walk up one flight of stairs. The weakness increased progressively until his admission to the hospital. During 1961 his skin became blue-gray in color and his hair, which had been sparse for a number of years, became much more so and, in fact, he had little or no axillary and no pubic hair. His mental processes became slower and he found it hard to concentrate. Two weeks prior to his admission his abdomen became swollen, he developed increasing dyspnea, ultimately his legs became swollen. These symptoms precipitated his admission to the hospital.

F.H.: His father died of myocardial infarction at the age of 72. His mother is alive and said to be a periodic alcoholic. One uncle died of pulmonary tuberculosis.

P.H.: He had the onset of Grand Mal epilepsy at the age of 18, at which time he was carefully studied and anticonvulsant therapy was prescribed. The patient continued this therapy until his admission to the hospital. The patient indulged in alcohol only occasionally.

Physical Examination: The patient was dyspneic, orthopneic, somewhat cyanotic and had a characteristic slate gray appearance to his skin. He was not icteric. Temperature was 100°F, blood pressure 115/70 mm. Hg., pulse 100 per minute, respiration 26 per minute. Examination of the head and neck was not remarkable except for the following: the hair was thin and scanty, the mucous membranes were slightly blue-gray in appearance; the neck veins were full and distended and filled from below; the lungs revealed decreased breath sounds over both lung bases posteriorly where there were many medium coarse and fine rales heard from the bases to the level of the inferior angles of the scapulae; the heart was enlarged to percussion, the rhythm was normal sinus, there were no murmurs or thrills heard, there was no pericardial friction rub; the abdomen was markedly distended; there was shifting dullness in the flanks; the liver was markedly enlarged occupying right upper and lower quadrants and to a lesser extent the left upper quadrant; it was hard with a sharp edge but it was not nodular; there was no evidence of collateral circulation; the testes were both atrophic; the extremities revealed 3 plus edema of both his legs, there was no varices, the nail beds were cyanotic. Neurological examination was within normal

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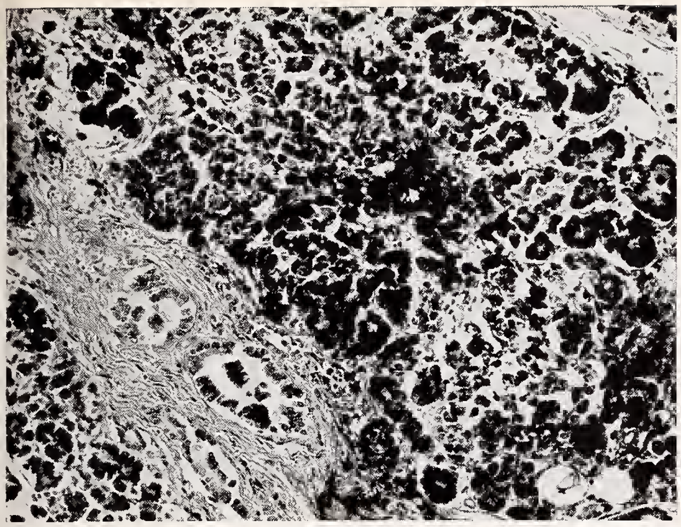

Figure I
Microscopic section demonstrating hemochromatosis of the liver of P.B.

limits except for generalized muscular weakness. The skin was slate gray in color, there was absence of axillary hair and scanty pubic hair present. There were no spider nevi present, the skin was not icteric.

Laboratory data on admission revealed the following: the hemoglobin was 13.7 grams; the hematocrit 41 volumes per cent; WBC 10,500 with 64 per cent segmented granulocytes, 1 basophil, 35 per cent lymphocytes. The urine was yellow, specific gravity was 1.020, there was 1 plus albumin and a negative sediment; blood sugar was 247 mgm. per cent, the bilirubin .8 mgm. per cent; cephalin flocculation 1 plus in 48 hours; cholesterol 186 mgm. per cent; acid phosphatase .2 units; alkaline phosphatase 3.2 units; the total protein was 7 gm. per cent with an albumin of 3.9 gm. per cent; globulin 3.1 gm. per cent; thymol turbidity was 4 units; the urea nitrogen 25 mgm. per cent; transaminase was 34 units; the PBI was 7.4 mcg. per cent; prothrombin time was 1 seconds with a control of 13 seconds; bone marrow biopsy was highly positive for hemosiderin type pigment. X-ray examination of the chest revealed discoid atelectasis of both lower lobes and evidence of chronic passive congestion. An electrocardiogram showed normal sinus rhythm at 100 with an auricular rate of 100 and a ventricular rate of 100, P-R interval of .14 seconds, a QRS interval of .07 seconds, the ST segments were slightly low in leads 1, V5, V6 and AVL, the T waves were low in lead 1, V4, V6 and diaphasic in AVL, electrical axis was to the left; these were interpreted as non-specific ST-T wave changes.

Course in the hospital: The patient was treated with oxygen, digitalis, diuretics, insulin and diet. In spite of these measures he progressively deteriorated and expired on 12/12/61.

An autopsy revealed the following: there were bilateral pleural effusions present, the lungs showed evidence of chronic passive congestion. The heart weighed 475 grams, the valves were not remarkable. The myocardium measured 4 mm. on the right side and 1.5 centimeters on the left side; section of the myocardium grossly was not remarkable; the liver weighed 6,500 grams and was firm, rust colored. The spleen weighed 500 grams but was otherwise not remarkable; the pancreas was dark colored grossly. The remaining viscera appeared grossly normal. Microscopically, the liver showed typical portal cirrhosis with marked amounts of hemosiderin pigment present in all the hepatic cells as well as many of the Kupffer cells. (Fig. I). Hemosiderin pigment was present to a large extent in the pancreas, the heart, mucus glands of the esophagus, the gastric glands, the renal tubules, the testes and the glomerulosa cells of the adrenal glands as well as in the sweat glands of the skin.

To investigate the famillial aspects of this case, a family tree was compiled and is illustrated in Fig. II. From this it is evident that the patient's mother, E.B.B., and two aunts on his paternal side are alive, the others having died of causes other than Hemochromatosis or diabetes mellitus. The patient's mother is known to over indulge in alcohol and is known to have an enlarged liver and a B.S.P. of 10 per cent retention in 30 minutes but no other abnormalities to suggest Hemochromatosis. She has not had a liver biopsy. Her menstrual history was entirely normal until her menopause at the age of 44. No studies were possible on the other two aunts as yet. The patient had one sister who is 47 years old and hypothyroid. She has had a normal menstrual life and has given birth to four live children. She does not over indulge in alcohol.

FIG. 2

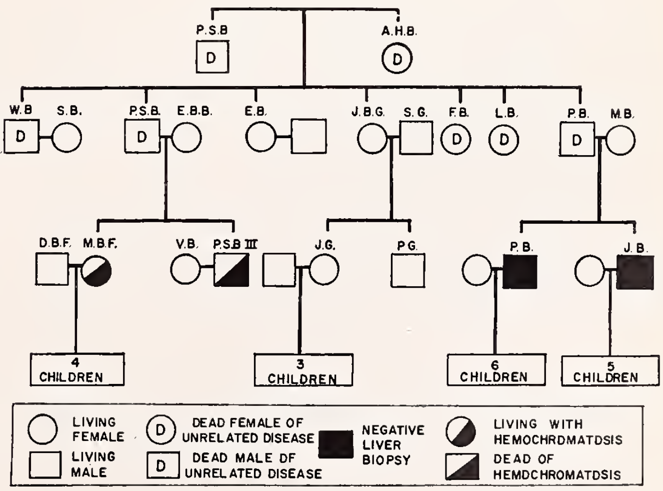

Figure II
Family tree of P.B.

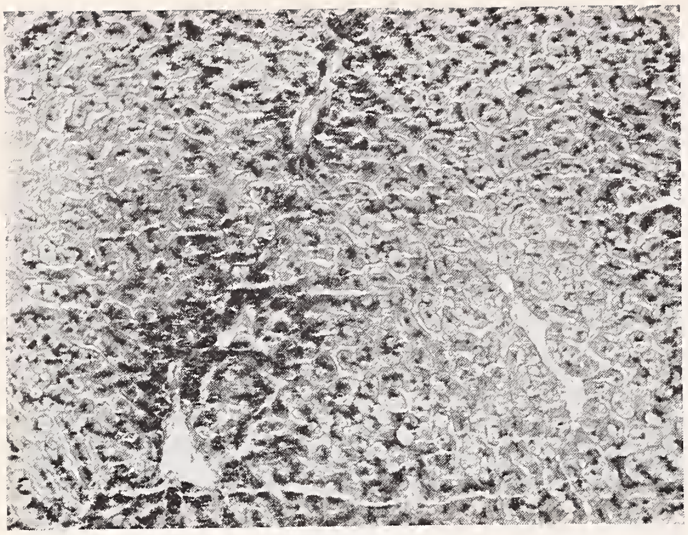

Figure III
A liver biopsy of sister of P.B. demonstrating hemosiderin deposits and early cirrhosis.

She has mild muscular weakness but otherwise shows no physical abnormalities. Her liver is not palpable. There is no laboratory evidence of diabetes mellitus. Other laboratory studies including CBC, urinalysis, B.S.P., Total Protein and A/G are all normal. The Cephalin Flocculation test is 4 plus in 48 hours. A liver biopsy shows mild portal cirrhosis with heavy hemosiderin deposits. (Fig. III) This patient is now under therapy for Hemochromatosis. Of the four cousins, two, J.B. and P.B. have had complete investigations including liver biopsies with negative results.

Although both children of E.B.B. have clinical Hemochromatosis, one cannot claim that the disease in this family is transmitted by a dominant gene, since both parents have not been adequately examined from a histological point of view. No autopsy material is available on the father of these patients, and to date the mother has not had a liver biopsy.

The difficulties involved with persuading relatives of victims of Hemochromatosis to submit to needle biopsy of the liver are evident. This procedure, however, is the only reliable method of making the diagnosis since it has been shown that serum iron values may be elevated without morphological evidence of either hemosiderin or Hemochromatosis of the liver. Finch and Finch[5] have observed that 20 per cent of the relatives of known hemochromatotic patients have elevated serum iron values, contrariwise evidence of Hemochromatosis without elevation of the serum iron has been noted by Frey et al.[1] Recently Pechet and MacDonald studied 125 autopsies and 80 random liver biopsies and reported the presence of hemosiderin in 64 per cent of all the autopsy patients, 58 per cent of histologically normal adult livers and 80 per cent cirrhotic livers. The iron pigment was usually slight in amount in the normal adult livers but in larger quantities in the cirrhotic livers. MacDonald[9] feels that Idiopathic Hemochromatosis is a variant of portal cirrhosis. This is contrary to the generally accepted concept of Idopathic Hemochromatosis as a congenital disease of iron metabolism in which portal cirrhosis and excessive quantities of hemosiderin are seen on liver biopsy. This difference of opinion cannot be settled until further studies are available.

Summary

A case of Idiopathic Familial Hemochromatosis is reported in detail. Investigation of the sibling of this patient revealed evidence both clinical and morphological of heretofore unknown Hemochromatosis.

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A Stereotaxic Instrument For Use In Man

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Stereotaxic techniques have become increasingly important for the relief of rigidity, tremors, and dystonias as well as for the alleviation of pain and the implantation of radioactive materials. What was once a laboratory procedure has now become an essential technique. For the most part "free hand" maneuvers for reaching subcortical targets have been abandoned, although it is possible in some instances to achieve clinical improvement comparable to that obtained with stereotaxic methods.[1] However, to secure accuracy "free hand" requires practice in many patients. Such experimentation is unwarranted when mechanical means are available.

In general, contemporary stereotaxic instruments[2, 6, 8] are derived from the principal of rectangular co-ordinates of the original Horsley-Clarke[4] design. Limitations inherent in a method depending essentially on the delivery of an electrode or catheter vertically through an individual opening gave rise to techniques depending on the relation of the intracranial target to the angle deviation from a fixed point (polar co-ordinates). Certain investigators[5, 7] with the aid of radiographic procedures resort to preoperative angle measurements carried out in a "phantom" or other model to be subsequently transposed to the patient. Ward[9] reports an apparatus in preparation ("planisphere") which "once the needle is in the brain adjustments can be made from that point with great accuracy to any additional point or points the surgeon may wish."

Stereotaxic instrumentation has acquired considerable complexity often involving superstructures, screws to the skull and maps, whose usefulness is considerably reduced because of biological variables. Techniques often depend on intricate calculations, at times inappropriate to our contemporary knowledge of the anatomical or physiological data. Large teams include physicists and mathematicians as well as engineers. Such personnel requirements as well as instrumental complexity tend to discourage the use of stereotaxy by the neurosurgeon practicing apart from large centers specializing in the use of the technique. He either does not participate in this forward step in contemporary neurosurgery or relies on the "free hand" method with its attendant difficulties, including the problem of keeping the electrode or catheter in place once the target has been reached.

The aim of this development of stereotaxic instrumentation for man is to make available equipment which is practical yet accurate in terms of available neuroanatomic and physiological data without involving maps, models, phantoms, or graphs. The design allows for the flexibility inherent in measurement of angles from a given reference point, permitting multiple skull openings over wide areas without the hindrance of superstructures. Rugged in construction, the instrumentation is portable and can be easily cared for by the usual operating room personnel.

Development and manufacture of the instrumentation was under the guidance of F. Alduk of the Castle Tool and Die Company, New Castle, Pennsylvania. This work was supported by a generous grant from Mr. Eugene Litman, Pittsburgh, Pennsylvania.

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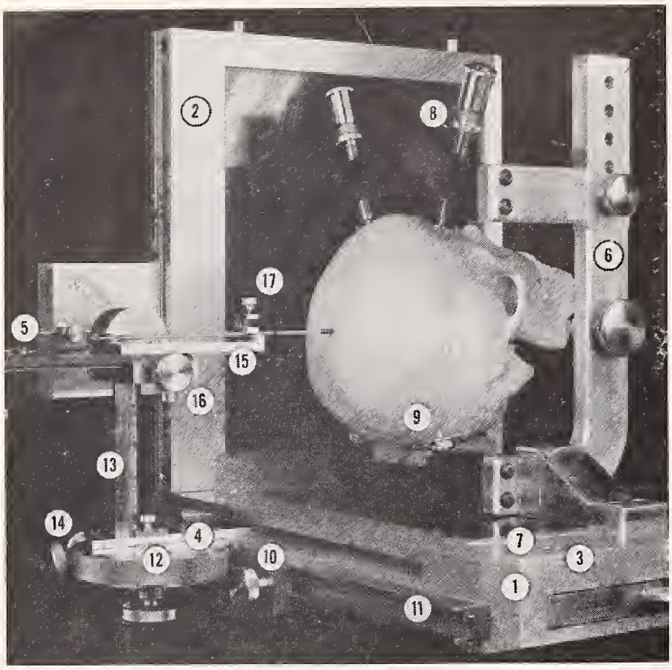

Figure I
Basic Stereotaxic Instrument. (Detailed description in text).

Description of Stereotaxic Instrumentation

The instrumentation (Fig. I) consists of three basic components: An x-ray cassette unit permitting anterior-posterior and lateral views of the skull, a head holder with rigid skeletal fixation, and an electrode or catheter carrying device, and two auxiliary pieces of equipment: an x-ray viewing box (Fig. II) on which desired modifications of angle may be made, and an electrode-catheter holder (Fig. III) which may be sutured to the skin to firmly secure its position, eliminating the danger of movement of the electrode or catheter insitu.

The x-ray cassette unit (Fig. I) (1) which carries the two other basic components, the headholder (6) and the electrode-catheter carrying mechanism (10) is held fast to the standard operating table by two screws delivered through the A-P cassette and table. (Two small openings in the operating table in no way interfere with its use for other purposes.) The lateral cassette (2) may be employed for left or right views by simple reversal and inversion to fit into the openings (3) on the A-P cassette. Both lateral and A-P cassettes contain adjustable metal strips, serving as guides which may be "placed" right on the target or an intracerebral reference point. The A-P metal guide (4) is mechanically synchronized with the carrier mechanism. The lateral guide (5) is adjustable manually along an 180 degree arc. The guides afford relatively precise information for location of skull opening and the direction of the electrode-catheter prior to actual invasion of brain substance, minimizing the need for possible readjustment within the brain.

The headholder (6) is designed for rigid head fixation with clear access to the face along a horizontal slot (7) in the A-P cassette. The position of the holder may be reversed and secured in the opposite slot when desired. The head is held immutable in the holder by skeletal fixation, the pressure to the skull accurately determined by gauge control (8). The skull points (9) which incorporate a spring device are removable for sterilization.

The electrode-catheter carrying mechanism (10) is bolted to the A-P cassette. It is manually adjustable along the calibrated edge of the cassette. (11) It has a circular stage (12) carrying the A-P marker which can be swung along a wide arc. The stage supports the vertical arm (13) of the electrode-catheter carrying device. The arm is under mechanical control (14) permitting lowering and elevation to the desired height. It is calibrated to permit return to any previously determined position.

The electrode-catheter mechanism is adjusted (15) as required depending on the target distance. It may also move along a wide arc. The delivery of the electrode or catheter to the target is under calibrated control (16). The electrode or catheter is held securely by a screw clamp (17).

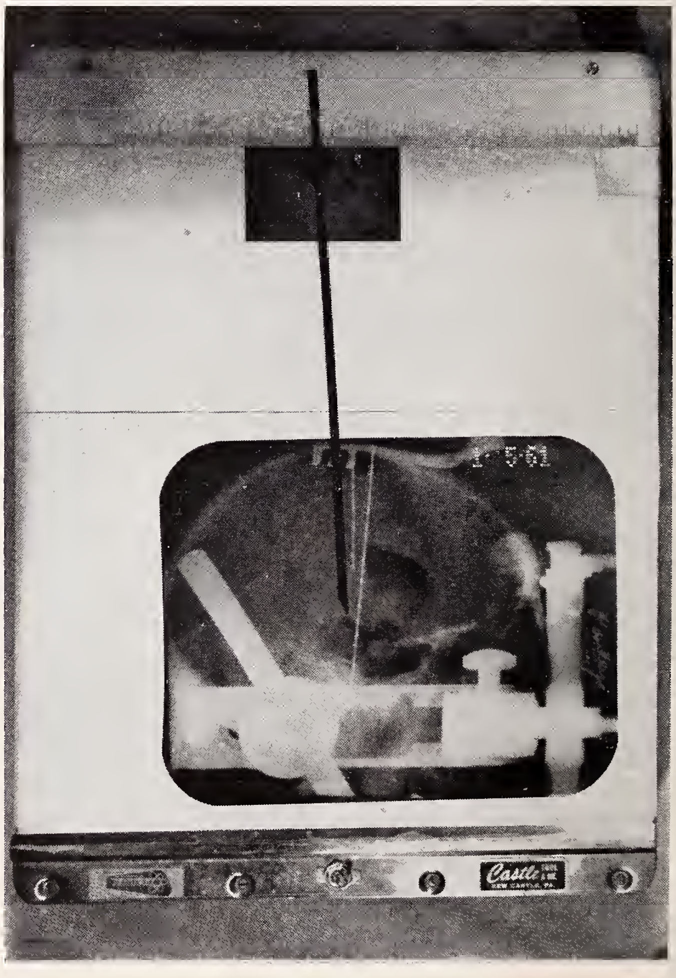

Figure II
X-ray Viewing Box for estimating Angle Adjustment.

Technique in the Utilization of the Stereotaxic Instrumentation

A pneumoencephalogram is performed under light pentothal anesthesia, the anesthetic maintained in most patients throughout the procedure. The patient is placed supine, the head is prepared where the skeletal points are to penetrate the scalp, and it is rigidly secured by turning the pressure calibrated screws. A sterile metal marking scriber, about the diameter of the catheter, is inserted into the electrode-catheter holder and delivered to the surface of the scalp, previously prepared with ether and merthiolate, at the point of intended penetration of the skull and the proposed direction for hitting the predetermined target. The guide in the A-P cassette is automatically synchronized with the

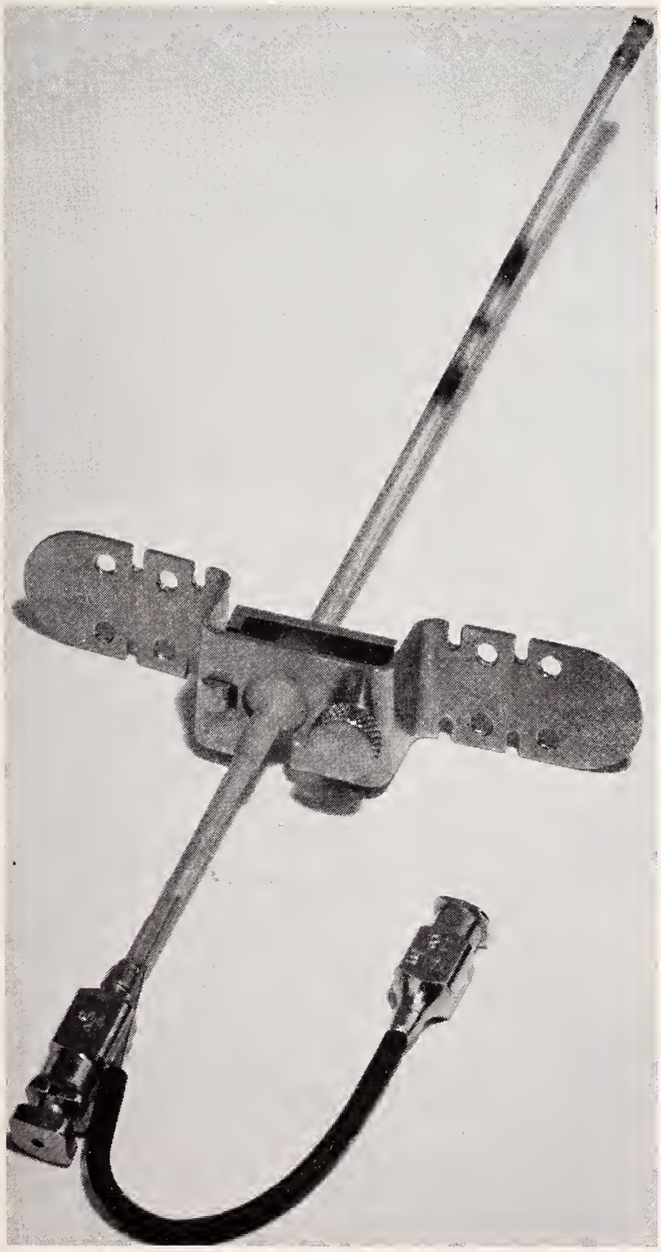

Figure III

Device for securing the catheter to the scalp for possible subsequent injections.

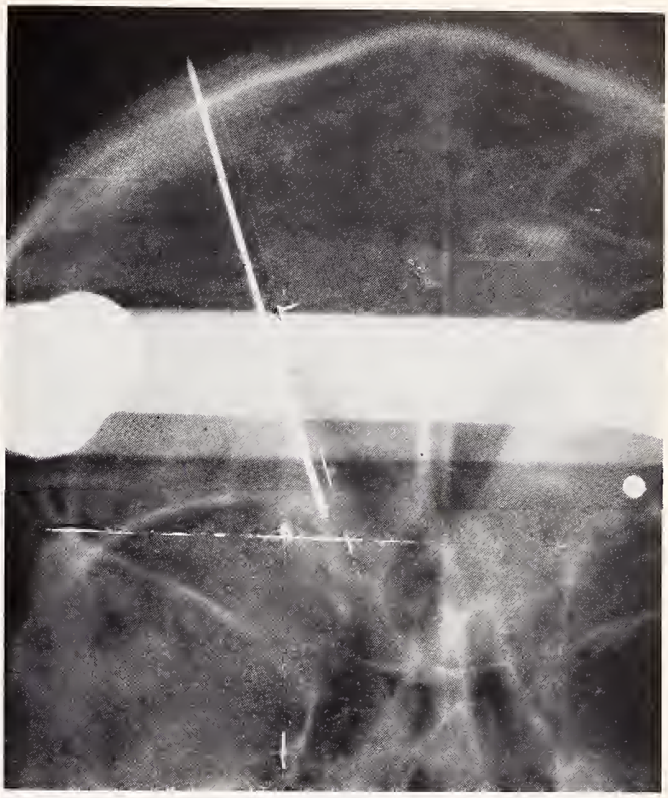

Figure IV

Antero-posterior view with metal guide in casette pointing at the target (thalamus) prior to opening of skull.

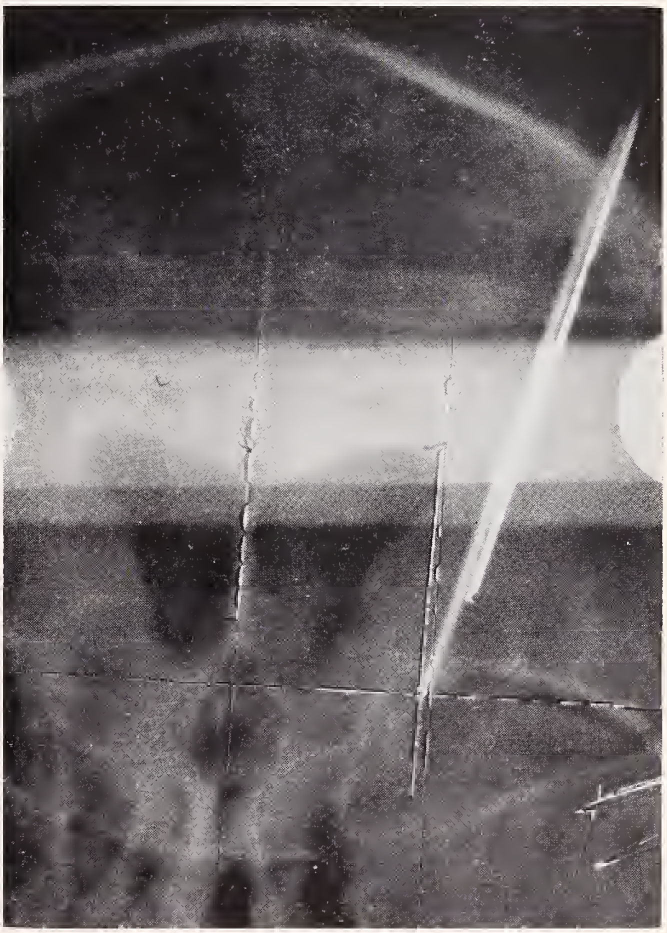

Figure V

Antero-posterior view disclosing the catheter following the direction of the metal guide to the target.

scriber. The metal guide in the lateral cassette is adjusted to the approximate position of an intracerebral reference point, (e.g. foramen of Monro). A-P and lateral x-rays are taken. (Two portable x-ray units are used, one for the lateral, the other for the A-P view, obviating the need for movement of the x-ray tubes once they have been placed in position, 36 inches from the head.) Appropriate changes if needed may be made in the anticipated location of the skull opening and in the angles of subsequent delivery of the electrode or catheter to the target after the x-rays have been seen. (In our patients only the Cooper catheter was used.) The exact location of the vertical bar of the electrode-catheter carrying device is recorded. The electrode catheter carrier, with the angles of inclination carefully maintained by tightening the screws, is lifted out of its stage and sterilized. The head is draped with a plastic covering to facilitate the visualization of external land marks if needed for x-ray adjustment. A burr opening is made at the point previously marked on the skull by the scriber. The dura is incised and the point of intended penetration of cortex electrocoagulated. The sterilized electrode-catheter carrying device is now re-inserted to the previously determined position in the stage. Delivery of the electrode-catheter to the target is accomplished with mechanical control. Check A-P and lateral x-ray views are taken. Usually not more than one adjustment is necessary until the target is reached (Figs. IV, V, VI) (The special x-ray viewing box (Fig. II) is useful in determining angle adjustment, if any, and the depth of penetration required to reach the target.) The position of the electrode-catheter is securely maintained by suturing the ball type holder (Fig. III) to the scalp. When the patient is fully responsive the catheter ballon is insufflated with .5 cc. of Hypaque solution and a final x-ray is taken (Fig. VII). Injections of Etopalin in accordance with clinical indications are performed as outlined by Cooper.[3]

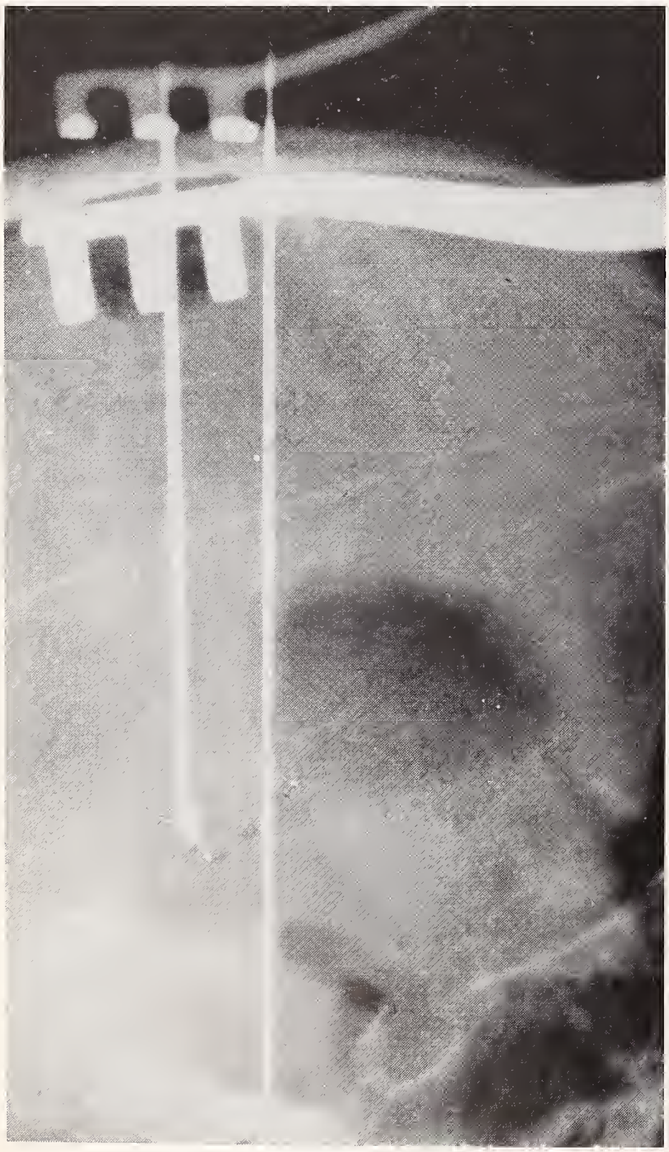

FIGURE VI

Lateral view revealing the metal guide at the site of the foramen of Monro and the catheter at the target (thalamus).

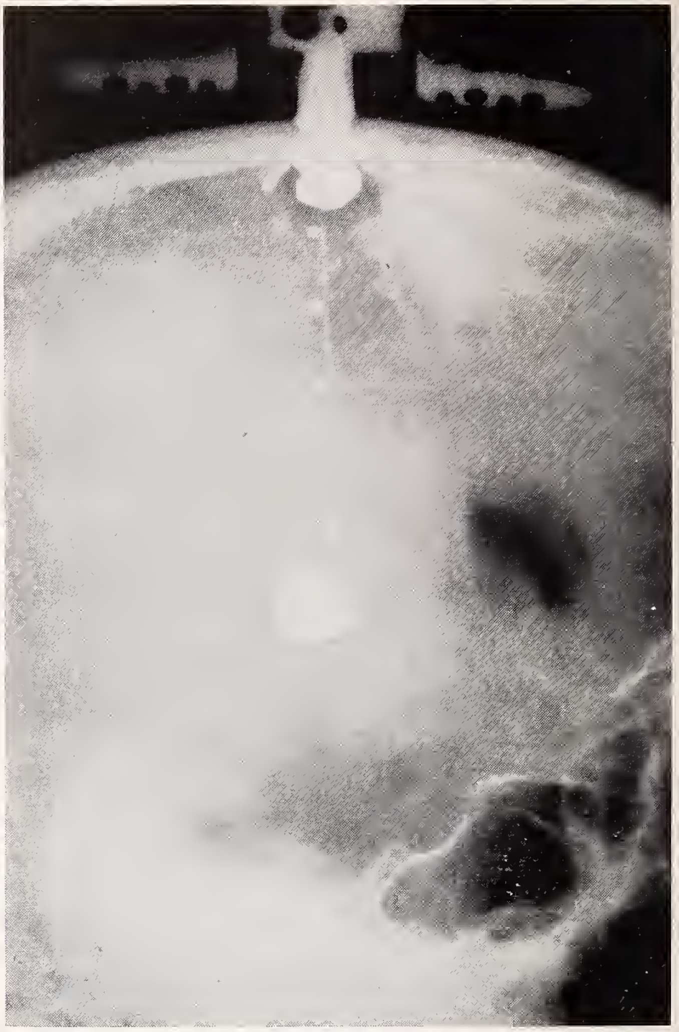

FIGURE VII

Lateral view of skull taken after closure with catheter in situ. Note device sutured to skin for securing catheter in place for subsequent injection.

Summary

Practical, flexible, rugged stereotaxic instrumentation has been developed. The technique described is well within the skills of the neurosurgeon not primarily specializing in stereotaxic surgery but who may utilize such procedure as part of the general practice of neurosurgery.

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> *What a splendid stimulant it would be for the beginner if his instructor instead of amazing and dismaying him with the sublimity of the great achievements of the past, should reveal to him the origin of each scientific discovery, the series of errors and missteps that preceded it—essential, from the human point of view to a truthful explanation of each discovery. Such skillful pedagogic tactics would bring about in us the conviction that the discoverer along with being an illustrious person of great talent and a powerful will was in the final analysis a human being like everyone else.*
>
> —Ramon Y. Cajal, *Precepts And Counsels In Scientific Investigation.*

Stages In Scientific Inquiry

Part I

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Much of the more formal terminology of science, such as law, theory, and so forth, is conspicuous by its absence from the work-a-day language of scientists. This is perhaps understandable when we realize the informality of the work-a-day laboratory —scientists feel uneasy using the stilted language of textbooks and pedagogy. Especially so, perhaps, since laws and theories are often associated with the great names in science and an understandable humility naturally avoids reference to the commonplace in terms typically associated with the names of geniuses. There is no area of human endeavor which venerates its great men more than science.

This suggests, however, that in teaching others about the activities of scientists it would be useful to use a more formal and presumably more precise language. But in this case two things often happen: first, certain terms disappear, especially in biology, where reference to theories and laws are limited by and large, to the cell concept and evolution; or, second, when used, the terms undergo hazy transformations—Mendel proposed certain hypotheses regarding the transmission of hereditary traits, but these became embodied in laws! evolution is no longer a theory, it is a fact! and so on. And, to make the matter worse, the scientist does not deny that science quite legitimately contains and uses the concepts of law, theory, fact, etc. but he is often acutely embarrassed to find that he cannot effectively define or apply these terms, even in the context of his own work.

Is it important to the scientist to be able to use effectively these terms and concepts? The answer is, Yes, and the aim of the discussion in the following pages is to support that affirmation. The line of argument is, briefly, the following: The aim of science is understanding and its achievement is an arduous, complex, stepwise process. If in this process we can find any guideposts to tell us where we are, where to go next, or to help us know when we've got where we want to go, these are useful. And in some cases more than useful; they can be essential for seeing the full dimensions of our work, of evaluating a major piece of work, or of seeing the interconnections of several areas of work. The scientific terms and concepts alluded to above can function as such almost indispensable signposts.

We will start by briefly outlining the process of scientific inquiry. This will allow us, in the succeeding section, to see how the terms are used as guideposts in demarcating shifts of disquisitional emphasis and the use of different modes of logical inference. Finally, we shall apply our approach to such classical biological concepts as the cell theory, Mendel's laws and the theory of evolution. Our purpose in this last section is to show how misleading the imprecise usage of "theory" and "law" can be, and what revaluation of these concepts is achieved by their more precise usage.

Outline Of Scientific Process

Any attempt to outline the scientific process is equivalent to talking about the scientific method. This latter phrase elicits reactions varying from the stereotyped formulations of unimaginative textbooks to those of uninhibited romanticism which defy any who would try to capture in words the

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activity of creation in science. Suffice it to say that we will try to avoid both extremes.

The scientist without a problem is like the medical practitioner without a patient—both are fretting because they have little or nothing to do. However the origin of a scientific problem is not the same as the origin of a patient. The first step for the scientist is to be aware of a problem and this can be what separates the greater from lesser men. To challenge what others have long accepted takes a special sort of sensitivity. Whorf (1940, p. 210) says ". . . our psychic makeup is somehow adjusted to disregard whole realms of phenomena that are so all-pervasive as to be irrelevant to our daily lives and needs." Though irrelevent to our daily lives they can be of key importance to our conception of the universe, as illustrated by the idea of gravity.

Simply being aware of the problem is only a beginning for often first insights are at best merely inadequate, and at worst, and very often, confused and misleading. In clarifying a problem there is an enormous complex of variables. Among these are concept formation and definition, observation which may include observation under experimental, namely, controlled, conditions, and possibly statistical examinations of the sample studied. These are basically descriptive activities which allow us to see the dimensions of our problem and from our observations various generalizations may emerge. These generalizations may be only vaguely related to our original starting point and along the way our original problem may have either disappeared, or become magnified and sharply focussed, or even metamorphosed into something new. Nonetheless, if a problem still remains we can now more readily formulate a precise question regarding it. This question, this precise formulation of a problem, is the first step in science.

Formulating a problem immediately points to the next step and that is explanation of the problem.

Many scientists still claim today that "She [science] does not explain, she states relations and associations of facts as simply as possible." (Wells, 1931) The point is that explanation in science does not and cannot refer to such things as "ultimate truths" and "basic realities." Explanation as commonly viewed today in science is the formulation and testing of "relations and associations of facts as simply as possible," such a view going back at least to Robert Boyle (Burtt, 1932, p. 177) and those who have maintained this view have avoided the metaphysical snares of connotative, subjective thinking and exploited objectivity in the fashion set forth so brilliantly by Gillispie (1960) or, again, by Reichenbach (1951).

The key point in scientific explanation is to relate previously unrelated statements. In general this relation is achieved in two ways, either by relating statements within a given problem area—often by use of special postulates or arbitrary models, or, on the other hand, by showing a statement to be a specific example of a more general situation. To make these situations clear let us look at two examples.

Mendel's "explanation" of inheritance is an example of the first type of explanation. Reference is not made to a more inclusive principle but rather, the generalizations of the problem area are related to each other by postulating entities with properties which can account for the generalizations. Specifically, Mendel's generalizations are the ratios of offspring phenotypes. These ratios are explained by postulating hereditary factors with certain properties (they are paired, they are transmitted as single units in gametes, they segregate and assort independently). The essential restriction on these postulates is simplicity—they must be the simplest conceivable which are adequate to account for the phenomena under consideration.

Darwin's realization that evolutionary change is a consequence of natural selection exemplifies the second type of explanation. In other words, the mutability of species is seen as a special case of the general situation included in the theory of natural selection. As we know, this theory refers to the differential survival of organisms having heritable variations which are advantageous in the ever-continuing struggle for existence. Given this selective process over many generations, Darwin saw that evolutionary change is one of its results.

Now a further point must be mentioned regarding explanation and that is the concept of causality. In the foregoing it was stated that explanations "relate previously unrelated statements"; we can now add that this must be a causal relationship. This is one of the most troublesome areas in the philosophy of science, its important intricacies must be set aside here by simply trying to define the logical properties of a causal statement. Its form is that of the classical "If A, then B," where A is the cause and B its effect. Further, A must always precede B in time. Beyond these simple notions one need not go at the present, except to add a few comments on the problem as it applies to biology.

Biology has always been plagued by teleological or purposive or goal—directed activities and their explanations have been a special problem. Several studies, notably Beckner (1959, chap. 7), have shown that teleological language in biology "has legitimate scientific uses" and "that no unique method of treatment is required" in the explanation of teleological behavior. It has recently been found useful by certain biologists (Pittendrigh 1958, p. 394) to replace the term "teleologic" by "teleonomic" and its cognates. The advantage gained is that the connotations of the older term can be avoided and emphasis given to mechanically causal events lying fully in the realm of scientific explanation, such as the development of an embryo which follows a predetermined course in arriving at the adult form.

Further complications connected with causality are the ideas of necessary and sufficient causes. Very rarely in biology are we able to identify sufficient causes, most of the time we deal with necessary ones. In illustrating the complexity of causality in biology Mayr (1961) discussed the variety of factors (each one necessary, but none by itself sufficient) which must be considered in explaining bird migration. This intricate problem led this biologist to state finally that "causality in biology is a far cry from causality in classical mechanics." (p. 1506). Nor is it more helpful to have Huxley (1943, p. 40) say that there are three aspects to be explained for any biological fact, a) mechanical, b) functional, and c) historical. This is another way of describing the several components needed for a sufficient causal explanation. These problems are treated more rigorously, from a logical point of view, by Beckner (1959).

The third and last step of the scientific process is to test the explanation. This can only be done if there exist testable predictions which are derived from the explanation. This means, of course, that the explanation *per se,* is not tested directly but that its consequences are subjected to testing, and this is where various problems enter. When is a prediction trivial and when is it critical? If a prediction is fulfilled are we automatically justified in accepting the explanation? If a prediction is unfulfilled is this because it is untestable? But might it be testable in the foreseeable future, and if so what do we conclude about our explanation? Does lack of fulfillment mean automatic rejection of the explanation? And finally, if the predictions are partially realized, what then?

In any case, testing of predictions often leads to further work. New problems thus emerge and the cycle of description, explanation and testing recommences.

Definitions And Use Of Scientific Terms

The preceding, very brief outline of the major steps of scientific inquiry has been couched in quite general terms, indeed, in terms that are probably not unfamiliar to most scientists and students of science in general. And nowhere was there employed the concepts which we wish to argue are useful for more effective understanding of the nature of scientific inquiry. It may seem we are defeating our own purpose by such a presentation but actually the point to be emphasized is that, though the foregoing may be intelligible enough to practitioners of science who pay their respects to these problems by a hasty nod and then hurry on to their lab benches, a closer examination of the terminology used reveals much looseness of expression and ambiguity. And more importantly, terms such as "generalizations may emerge," "if there exist testable predictions," and so on, do not make clear what the logical steps are which must be followed, unconsciously or consciously, to obtain descriptive generalizations or testable predictions. However, as we shall see, the introduction of more precise terms is not always helpful for there is still conspicuous disagreement among the specialists in this area as to what is best contained under a given term. In some cases, such as "experiment" and "prediction" we shall see there is nothing to do but accept at least two different uses of these terms, but in that we can distinguish these different aspects we have moved a bit further towards our aim of clarification.

Now let us return to the first, the descriptive, activities.

Among the many topics here that deserve precise formulation let us look at two, the problem of definition and of generalization.

Briefly, there are at least three kinds of definitions, i.e. ostensive, intensive and extensive. The first refers to definition by example, as when a person is asked to define what is meant by Erlenmeyer flask and he responds by pointing to one. Such definitions contrast sharply with intensive definitions which define by listing key properties of the object under consideration. In the case of the Erlenmeyer flask, an intensive definition would refer to the special shape of the flask, probably also to its more common uses, and possibly to the sizes it comes in. It need not mention the thickness of the glass nor its color nor its manufacturer. Finally, extensive definitions are defined as the class of entities having certain properties in common. Whereas an intensive definition focuses on properties, the extension of this definition refers to all entities possessing these properties.

It may be useful here to comment on a sort of procedural interconnection of these three types of definition. The ostensive definition is often an intuitive step, taken when we are first feeling our way into a problem. It is useful for a preliminary tacking on of labels such that we say "Let's call this A and that B," etc. Then we collect all our A's together and try to see why it was we felt we could label them all as A; namely, what properties do they have in common? The clarification of these common properties allows us an intensive definition. As a check on the validity or usefulness of this definition we can examine its extension. If we find that it coincides with all entities we would intuitively refer to as A, then we can feel justified in accepting the intensive definition as adequate. If the extensively and ostensively defined entities do not coincide, the intensive definition is due some revision.

Examining next the second topic, generalization, we find the problem of inductive inference. Let us assume our concepts are adequately defined. We wish now to describe our problem area in terms of these concepts and emerge from considerations of specifics to general ideas. For example, having defined cows and what is meant by their legs, we can emerge with the generalization "Cows have four legs." It is obvious that not all cows were examined; a sample was observed. Scientists rarely if ever describe completely—in the literal sense; they describe what is adequate for their needs, their needs being circumscribed by a sample sufficient to support their conclusions. What is observable for a limited number of cases is assumed to hold for all similar cases. This means of course that the conclusions include more than the original observations. This is why such conclusions or generalizations are referred to as *synthetic* statements,[1] this term being essentially synonymous with the older term of induction or inductive inference.

Inductive generalizations have been called laws by scientists. For example, Dollo's and Williston's laws, concerning, respectively, the irreversibility of evolution and the progressive evolutionary simplification and specialization of organisms, are direct summaries of a limited number of observed cases Kepler's laws of planetary motion are likewise generalizations derived from many painstaking observations on the positions of planets. But there is an extremely important difference between the first two examples and the third. The first are examples of what have been called inductions by enumeration and the second induction by intuition. (These terms go back to Whewell (1849); for a modern discussion see Frank (1957).) The phrases are essentially self-explanatory and emphasize, especially, the creative quality of the latter type of inference. In fact, in recognition of the special nature of intuitive induction it has also been called by Pierce *abduction* or *retroduction* and Kepler's work is termed "the greatest piece of Retroductive reasoning ever performed." (Quoted by N. R. Hanson (1958), p. 85.) The key aspect of retroduction is a new type of ordering of observations, ". . . the elements of inquiry coagulate into an intelligible pattern," to use N. R. Hanson's striking phrase (1958, p. 86). This new pattern does not represent a simple general statement of the original observations, as is the case with the enumerative induction that "Cows have four legs," rather, it represents a new insight into the ordering of the data, a new mode of stating relationships contained in the data. Into this category would fit Darwin's insight that his zoogeographic and paleontological observations could be placed in a new, intelligible pattern if it were assumed that species could change over many generations.

For our present purposes we shall recognize that the term law is more usefully applied to retroductive or intuitive inductive statements and not so much to simple enumerative inductions. For the latter reduce a law to triviality, placing statements such as "heated bodies expand," "robins' eggs are blue," along side the insights such as those embodied in laws of planetary motion or of organic evolution.

Finally, not all statements labelled as scientific laws are inductive generalizations of any sort. Mendel's laws, as we shall see are hypothetical constructs and inferences of a more deductive than inductive nature. And certain statements which are true solely on logical grounds are also called laws (Hempel and Oppenheim 1948). These two examples lie in the realm of hypothetico-deductive statements which realm is the area of explanation in scientific inquiry. Let us now turn to that problem.

Summary

Scientific inquiry, in its everyday practice, is marked by the absence of a precisely defined terminology. Such a terminology, using the concepts of law, theory, inductive and deductive inference, etc., is useful in examining scientific work. To establish this thesis there are examined here the following three topics: a) a brief outline of scientific enquiry, b) the place in this enquiry of a clearly defined set of terms, and c) the application of these terms to certain biological ideas for the purpose of their clarification and evaluation.

The outline of scientific enquiry emphasizes three fundamental steps: formulation of a problem, proposal of an explanation, and testing the explanation. Various special problems are discussed under each of these steps.

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[1] The term synthetic, and its counterpart analytic, are used here in their logical sense, not in their everyday sense, nor even their everyday scientific sense. Most scientists are unfortunately unaware of the technical meaning of these terms (cf. Cassidy 1960).

Special terms and concepts useful for characterizing these steps include the following. Formulation of a problem demands definition and inductive or synthetic statements. Specially to be noted is the role of intuitive induction or retroduction.

This is the first of a series of two articles.

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As to your method of work, I have a single bit of advice which I give with the ernest conviciton of its paramount influence in any success which may have attended my efforts in life—Take no thought for the morrow, live neither in the past or the future, but let each days work absorb your entire energies and satisfy your widest ambition. That was a singular but very wise answer which Cromwell gave to Belleview.—"No one rises so high as he who knows not whither he is going" This is found in Matthew 6:34.

—William Osler—*Aphorisms.*

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EDITORIALS

Old Age Or Sickness

Our practices in the future are going to be increasingly among the elderly, for there is an upward trend in the number of the elderly as infectious, degenerative diseases, and nutritional disorders tend to be conquered, and the trend is bound to continue. As the doctor watches in man the changes which come with age, he becomes aware that flexibility is continually dropping out of the system. He sees that a man of 50 is a markedly different man than the man of 30. He begins to appreciate that at any given point in time behavior changes, and believes that there must be structural changes that develop which underlie the behavior changes.

In this issue of the Journal[1] some of the changes occurring during senescence are set forth. Loss of cells in all organs, important changes in enzymatic activity, a change in the collagen and connecting tissues of the body, and very well recognized specific alterations in machinery of each cell which makes it difficult to synthesize vital proteins such as elastin and doubtless others. A normal person adjusts rapidly to maintain a normal external and internal environment. In such a person the body effectively buffers the effects of the stimulus so that the stimulus appears to the observer to be a weak one, even though in reality it may be a potent one and only appear inert because of the effective counterforces mobilized by the body. As senescent changes appear in the body it becomes more aware of the forces of many previously unappreciated stimuli. We are quite aware of this process when disease has destroyed cells in an organ. We recognize it as loss of reserve.

Destroy the sympathetic nervous system and the patient loses consciousness on standing. Destroy the lung by emphysema, then dyspnea and cyanosis occurs on the slightest exertion. Alter the heart by any manner to reduce its contractile power and even apprehension can quickly lead to pulmonary edema. Reduce the number of brain cells and a wide variety of behavioral changes, these being different in different individuals depending upon the region of the brain that is deprived.

The aged person, like the sick one, has lost part of his ability to adjust to external environment and to maintain a constant internal environment. Because his organs are especially sensitive to small changes, he is repetitively made aware of minute changes in the external and intrnal environment. This tends to alter his position in the family, in the community, and in his occupation. In short, the physician must bear in mind that the inability of the patient to function effectively is a reflection of the structural state of his body, which includes brain, heart, and all organs and tissues.

The simple facts about growing old, as distinct from the biology of aging have been known and described for centuries, but both the patient and those around him still refuse to recognize them. Instead, from all sides the aim and sometimes the result is to show the old person as someone who is sick rather than merely old. An aged person who is frail, dozing by day, forgetful, repetitive and boring, selfish and perhaps consumed by fear of death is not sick. All this is as normal as the comparable behavior of early childhood, but it behooves the doctor to learn where physiology ends and pathology begins, although often we do not yet know where the division lies, we must seek through experience how to distinguish between the old and the sick to avoid serious pitfalls in management.

The doctor is a friend as well as a physician and he can help often with simple advice more than with anything else if he can expertly assess the symptoms brought to him. He must be able to recognize when an old person is fit, though old, when he is fit and old although neglected, whether the patient is old and emotionally unstable, or whether he is old and mentally or physically ill.

The fact is that only a small group of old people are physically sick and we must be on our guard against wrongly assessing the patients' symptoms and signs. It is only too easy to allow healthy old age to slip into irreversible pathological old age. As we look at our patients we should try to assess their real age and if possible, how much longer they have to live, for it is vital to keep the old person active unless his days are numbered and the struggle to do so is unimportant. Optimism can do only good. Gloom and pessimism, thinking that a patient is more feeble and more ill and older than he is, can undermine whatever chances of improvement he may have. Old people are a constant prey to fears about their future and yet are reluctant to reveal how large a part these fears play in making them ill. If they understood that everybody ages at a different rate and that there is no need to feel old, act old, look old just because they are 70, their morale which is a precious thing, will not ooze away.

It is admitted that there are misleading factors that tend to make both the doctor and patient wrongly atribute to age removable burdens. Loss of interest in living has been mentioned. Then there is malnutrition, anemia, certain behavior changes which must not be mistaken for psychosis. Temper tantrums, rejection of food and medicine, bouts of excitement or confusion may be due to resentment and frustration of being old, of frustration of being in a hospital and fear of dying. To understand the emotional process of the aging mind is never easy, but it must be done if we are to avoid labelling patients "senile" or demented when in fact they are reacting within the limits of normal for their age. If the patient is tactfully handled and he has insight, he can be brought to talk quite reasonably and thus dispose of any diagnosis of true psychiatric illusions. Unfortunately, many people appear to be ignorant of the changes due to growing old so that their aim and sometimes the result of their actions is to show the old person as someone who is sick rather than merely old.

Naturally disabilities as opposed to active disease, abounds in the elderly. What is equally common is failure on the part of the patient to try to fight his trouble as a younger person would. Sometimes the patient might exaggerate his symptoms to the doctor in search of pity or to persuade the doctor that the trouble is entirely medical. They may wish to hide behind the disability and feign complete defeat. In this case, we must weigh each disability as we would in a younger person, and as with them, persuade the patient to make the best of it for morale is precious and it is the duty of the doctor to cultivate it assiduously.

Often what we see is the frailty of age distorted into what looks like illness by extreme causes. After all, we are looking at people who, year by year, find it harder to provide unaided what is needed to keep themselves afloat in life. Many of the factors that complicate old age are actually non-medical. Lack of a comfortable home may well give life an unhappy ending just as it gives a child a poor start. Those who are growing old have basic needs which they often lack in greater or less degree such as understanding and sympathy, security and shelter, relatives and friends, money and proper food, reasonable health and activity or a family doctor who is also a friend. Then when many of these needs cannot be met we find simple old age confused by a series of deficiencies. Like children, older people are unable to sort out their needs for themselves. They may turn automatically to their doctor, who can assess their symptoms, give them understanding but cannot order their personal lives. The doctor cannot find them friends, keep them clean, and feed them properly. For what old people really need is food, shelter, warmth, cleanliness. They need activity in their homes, daily rounds among friends and confidence in their physical powers.[1]

The diagnosis of irreparable old age is harmful for a proper approach can secure reversibility of the chronically aged as opposed to the chronically sick. Our hope is to guide them away from easily anticipated trouble. Only a small proportion of these are really ill. The family doctor is and should be the real expert in handling old people. In every practice there are many who live fully and happily to the real end of their days because all or most of their needs in the form of security, affection, interest, company, food, and money are satisfactorily met. If they are not bereft and neglected their medical needs are simply and easily met. Our task as doctors is to make clear that old age is a journey which calls for increasing amounts of simple help. As Kemp rightly stated, "Though age is a season of need, the need is rarely medical."[2]

L.H.N.

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Vascular Repair

Since Carrell's day certain principles for vascular suture were laid down and still remain the basis for developing surgical skill in anastomosing and repairing blood vessels. In learning to do arterial operations the vessel wall was approximated with fine silk sutures. It requires detailed and painstaking work and is excellent for training but takes a long time and is poorly suited for the poor risk who is ill and should not undergo a lengthy operation. Heparin has prevented clotting and plastic cloth arterial prostheses in place of homografts has eliminated the bothersome stage of graft preparation which was a long difficult phase of the operation. In general however, the resident officer and his chief are not often confident enough in the technique of suture to attempt primary reconstruction when a healthy injured artery needs repair. Instead of repairing it at once, such patients may have to be sent to a vascular center and he may arrive too late to be helped.

In the U.S.S.R. much experiment has been devoted to the development of semi-automatic devices for the anastomosis of hollow viscera by minute staples of tantalum wire set in removable toolrings. Considerable experience has been accumulated in joining small healthy arteries by this method.[1] In Ottawa Vogelfanger *et al*[2] used a simpler, though similar machine and experimentally anastomosed femoral arteries and veins in small dogs. The vessel diameter was no more than two to three mm. No anticoagulants were used yet the rate of late patency was as high as 86-87 per cent. Takaro and his colleagues used a stapling type of anastomosis to replace the vena cava experimentally with a "teflon" cloth prothesis. The lower anastomoses were more satisfactory than the upper, which underwent late constriction. This the author attributed to the presence of atrial type tissue in the termination of the vena cava where the anastomosis was made. It is clear enough from what has been said above that such methods may well be suitable for rapid anastomosis of normal arteries especially those needed in organ transplantation. But what success it will have in repair of arteries dilated and distorted by disease remains to be seen.

Tibbs[4] designed a double acting synchronized needleholder which appears to be very suitable for rapid placing of a longitudinal suture line as is needed in aorta-iliac thrombo-endarterectomy. But the instrument like those mentioned above still requires exceptional skill and the painstaking application to detail laid down by Carrell. Though the use of these instruments has greatly shortened the time for operation, specialized skill in anastomosis still limits this field, excluding most general surgeons.

A new and revolutionary development reported by Healey *et al*[5] promises to so simplify rapid anastomosing of blood vessels and hollow viscera, that when developed it ought to be within the competence of any good general surgeon. Healey *et al* required a rapid method for anastomosing blood vessels for their experiments on liver transplantation of dogs. They therefore, decided to try an industrial glue methyl 2-cyanoacrylate (Eastman 910 Adhesive) which polymerizes without heat, pressure, catalysts or any of the tissue damaging agents contained in most preparations of this kind. The substance, which was found also to be self-sterilizing, was used to repair superior and inferior vena cava and the portal vein in forty dogs (120 veins in all). None of those animals which subsequently died showed hemorrhage, thrombosis, infection or stenosis at the site of repair.

Healey *et al* then tried the technique in twenty circular repairs of the carotid arteries in dogs. Although the vessels needed some form of support in the form of a special pair of rings or lateral clamps, in 170 repairs carried out by this rather startling method there were only two deaths from hemorrhage. Histological evidence in these two cases showed that the hemorrhage was due to the clamp not the glue. All specimens examined in the first post-operative week showed an acute inflammatory reaction in the adjoining walls no greater than in conventional suture repair.

Healey *et al* mention perfectly satisfactory results with the glue in the repair of other hollow viscera such as bronchi, ureters, bile ducts and small bowel. In this last viscus, an averting type of apposition enabled the surgeons to use the glue on the full thickness of the wall. Longmire[6] has applied the glue to the deep cut surface of the liver to control bleeding at operation. There is no doubt that surgeons will be quick to see other possible uses for the glue. When the efficacy of this glue has been tested in the presence of structural disease and operative tension and found satisfactory only then will it have passed the crucial test.

With vascular surgeons being increasingly called upon to repair carotid and vertebral arteries, aneurysms of the large vessels, stenosis of renal and femoral arteries and its branches, as well as traumatized arteries, it is comforting to observe the rapid expansion of technology in this important field. It is not surprising that the blessings will overflow to facilitate repairs in all hollow viscera.

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The Anti-Coagulation Controversy

Every clinical trial involves some ethical problem. In the case of anticoagulant therapy, since it has been receiving increasing and now widespread use in acute myocardial infarction, any physician withholding it when it may possibly be of value, could be subject to blame if the course turns out to be unfavorable. Today the doctor is in a greater dilemma than he was ten years ago, because the therapy then was routine, no longer subject to controversy. Now new evidence is beginning to appear that clearly calls for a fresh look at the problem.

What have the favorable effects of anticoagulant therapy been attributed to? One is the reduction of the incidence of intracardiac thrombi and systemic pulmonary emboli. Even in the celebrated report from Copenhagen[1] which concludes that anticoagulant therapy should be abandoned, pulmonary thromboembolic complications in the treated cases were five per cent as compared to 28 per cent in the untreated ones. However, the fewer instances of both mild and fatal pulmonary infarction are due to the action on the peripheral venous systems, since the British[8, 9] found no difference as regards the incidence of intracardiac thrombi between the treated and untreated cases. Capeci and Levy[2] found no important difference at autopsy in the incidence of thromboembolism in the treated and untreated controls and a similar experience was noted by Waldon *et al* at the Massachusetts General Hospital.[3] It should be noted, however, that these studies deal with patients that had died and offer no clue as to reduction in thromboembolic episodes in the survivors. Nor do such studies throw light upon whether anticoagulants can ameliorate the severity of the disease.

From the physiological standpoint, anticoagulant therapy is not believed to contribute a fibrinolytic element, if a clot causes the coronary occlusion. Consequently, up to the present time no one thought of the possible ways such a treatment might ameliorate the disease in the heart itself and therefore to search for such evidence. One possible way in which anticoagulation could reduce the severity of an infarction is the prevention of clot propagation which could close collateral channels. Another method of amelioration could result if local fibrinolytic elements were liberated in and around the offending clot leading to its lysis. In the absence of anticoagulant therapy a clot could quickly reform and reocclude the vessel. Such speculations have been offered to explain the phenomenon of recurrent mild strokes and might also operate in some cases of coronary thrombosis. With such possibilities in mind trained investigators will in the future search for such instances, for if they exist, it would greatly strengthen the hands of those who routinely employ anticoagulant treatment in acute myocardial infarction. It is better to treat many patients unnecessarily than to have one patient die from lack of a given treatment. This, of course, presupposes that the danger of a treatment is distinctly less than the assumed benefits.

The dangers of anticoagulant therapy are known. One is hemorrhage which has been observed in almost every organ and tissue in the body, occurring occasionally when the prothrombin levels have been within the prescribed limits of safety. The hemorrhage may and generally is slight and readily controlled, or massive and sometimes fatal. The incidence has varied from 9-27 per cent. What is more distressing is that it was found in the patients who died, although unrecognized antemortem. It occurred as pericardial hemorrhagic effusion in 12 per cent of the cases reported from Denmark[7] where the patients were hospitalized and anticoagulant therapy was well controlled.

Cardiac rupture is another grave complication of myocardial infarction which occurred three times as often in the cases treated with Coumarin derivatives as compared to those not treated. In 797 cases collected from the literature by Capeci and Levy[2] 557 were not treated. 239 were adequately treated. Proved rupture occurred in 3.9 per cent of the untreated and in 12.1 per cent of the treated cases a ratio of 3.1. This incidentally is the same ratio that occurred in the Danish series with respect to hemorrhagic pericardial effusion.

It is not surprising, that as data continues to accumulate, the dangers of the therapy are beginning to weigh in the balance against the supposed benefits, and positive views are beginning to appear for and against the anticoagulation treatment. At present two opposite positions have been stated on the problem. From the Danish group "the conclusion must be that anticoagulant therapy is not indicated in acute myocardial infarction." From Friedberg[4] who seriously criticized the Danish study and remained convinced that the data reported from Denmark "does not justify the conclusion that anticoagulant treatment is not indicated in acute myocardial infarction." Whatever guide posts for the practicing physician that have appeared from this controversy, the ethical problem has vanished. It is unlikely that a physician who chooses to withhold anticoagulant therapy from his patient with acute myocardial infarction can any longer be subject to blame; since if hemorrhage or cardiac rupture occurs the responsibility is also his.

When the question of long term anticoagulant treatment arises and what benefits may be expected from it, the situation is equally ambivalent. The British Medical Research Council[5] in a preliminary analysis of the results obtained in 300 selected patients concluded "Such therapy can make a useful if limited contribution to the after-care of patients who had recovered from the acute phase of myocardial infarction." McMichael and Parry[6] have taken issue with this conclusion after reviewing 5,000 cases, stating that the evidence that long term anticoagulant prophylaxis prevents recurrence or reduces mortality after the acute attack is inadequate. On the other hand, Bjerkelund[7] in Oslo has taken an intermediate position. He believes that long term treatment in all patients for the rest of their lives is not justified and such an undertaking would be practically and economically impossible. "More could be accomplished by treating for six months all patients or a number of young patients who have had only one infarct." Clearly there is need for reconciliation for such diverse judgments. When experts disagree what can the doctor do? As of now, the decision as to which course he chooses to follow, is no longer routine. It rests with him. He will probably wish to concentrate more upon diet, exercise, hygienic living, elimination of factors that lead to atherosclerosis and weight reduction. In this respect he will become more of a physician and less of a technician who relies upon but one factor to guide his patient to health and longer life.

L.H.N.

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The Mesenteric Circulation Comes Of Age

There are two causes leading to hypotension and ultimately shock: Those that decrease the ability of the heart to pump blood such as myocardial infarction and arrhythmias particularly ventricular tachycardia, and those that tend to decrease the venous return such as hemorrhage, burns, trauma, endotoxic shock etc. To support the arterial pressure in such states circulatory reflexes sometimes cause such an intense vasospasm, that they can actually become detrimental to the nutrition of several parts of the body particularly the mesenteric system and the kidneys. The intense vasospasm in some areas helps to maintain an arterial pressure and adequate blood supply to the heart and the brain whose arterioles are not constricted by sympathetic impulses and whose integrity has a higher priority in the survival of the animal.

Because of the lower order of importance of the kidneys and the gastrointestinal tract in animal survival, the clinician is accustomed to give less thought to the behavior of the mesenteric vascular bed than to any of the others, in part because this area is less vulnerable to short periods of anoxia than is the brain or the heart, and in part because it is less apparent clinically. A sharp reduction in cerebral blood flow is quickly apparent in the patient by the dulling of the sensorium or even syncope. We quickly recognize sharp reduction of renal blood flow by cessation of urine secretion. If the heart is deprived of its blood supply anginal pain is experienced. The character of the skin circulation is quickly recognized by its flushing, blanching and its temperature. But angiospasm of the arteriolar bed of the intestines is not so easily recognized, unless it advances to the very extreme state of bloody diarrhoea an overt evidence of necrosis of the mucosa.

The concept is well established that the renal and mesenteric arterial supply play a large role in supporting the level of arterial pressure whenever factors arise that tend to lower it. The kidneys receive about 1250 m.l. blood at rest while the splanchnic bed receives somewhat over one quarter of the cardiac output. It is thus easy to see how shunting one half of the total blood flow from these two regions can play a potent role in supporting the level of arterial pressure. The more the general circulation is in trouble, the more angiospasm one would expect to find in the mesenteric vascular bed.

With ultrasonic flow meters attached to arteries it is now easy to record changing blood flows in different regions and with this mthod Corday et al[1] have just recorded the changes in the mesenteric artery blood flow in various conditions that lead to hypotension, such as cardiac arrhythmias and hemorrhagic shock. The results obtained emphasize again the importance of the mesenteric vascular system in the support of general arterial pressure and the extreme vasospasm which the portal system undergoes in shocklike states. In fact the increased vasospasm of the arteriolar bed in the bowel wall may actually proceed to the point of strangling the bowel circulation and ultimately to necrosis of the gastro-intestinal mucosa, a condition called the "Lethal Factor" in shock. It is obvious that treating shock with vasopressor drugs, when severe vasospasm of the portal system is already threatening life, can add only insult to injury and that our approach to the treatment of shock must take this physiologic fact into account.

With the recognition of the physiologic basis of the circulatory adjustments in hypotension from whatever cause, it is not surprising to find an increasing number of reports of hemorrhagic or necrotic lesions of the gastro-intestinal tract in the course of those conditions in which the cardiac output declines substantially. Ming and Levitan[2] described acute hemorrhagic necrosis of the gastro-intestinal tract mucosa often accompanied by bloody diarrhoea in eleven patients with cardiac arrhythmia, congestive heart failure and irreversible shock states. Hoffman et al[3] reported three cases of massive intestinal infarction occurring in patients with aortic insufficiency without associated vascular occlusion. Glotzer and Shaw[4] demonstrated extensive infarction of the colon in patients with patent mesenteric arteries but in whom mesenteric artery spasm must have been present because the patients were suffering from myocardial infarction or hemorrhagic shock. Berkowitz[5] found that following cardiac surgery acute ulcerative lesions of the gastrointestinal tract occurred in 15 per cent of patients in many of whom prolonged hypotension was present.

It is obvious that if mesenteric artery narrowing already exists prior to the onset of hypotension or a reduced cardiac output, then strangulation of the blood flow to the mesenteric bed can occur more easily and lead to necrosis or infarction of a specific area of the gastrointestinal tract. Can this be the explanation of the relationship that has long been known between peptic ulceration and myocardial infarction as well as with various types of remote surgery, or burns or trauma?[6]

Physiology advances and with it our horizon broadens. We must now be more alert to the mesenteric circulation and strive more than ever to prevent its strangulation. Corday et al point out that mild forms of mesenteric insufficiency are characterized by nausea, abdominal pain, vomiting, diarrhoea, abdominal distension and constipation. These are the danger signals of lethal things to come, in any patient in whom mesenteric angiospasm is already in evidence.

L.H.N.

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And Now The Hair Spray

The world has been widely contaminated with substances used in the control of insects. It is claimed[5] that such substances are poisoning not only pests but also humans, wildlife, soil, food and water. Man is also constantly exposing his lungs to a wide variety of noxious agents, some unwillingly others wilfully. The best known of the resulting syndromes are those produced by the inhalation of dusts: silicosis, asbestosis and beryllosis. The diseases of the lungs caused by air pollution are very extensive, the most important cause of course is cigarette smoke.

Recently a rather esoteric group has accumulated including "Farmers lung" which is probably due to dust and mold inhalation, maple-bark disease caused by inhalation of spores; bagassosis produced by dry sugar-cane dust; silo-fillers disease, thought to be due to nitrous oxide fumes; and a possibly related syndrome affecting mushroom workers. Pulmonary alveolar proteinosis and sarcoidosis may be related to inhaled pathogenic agents. And now comes thesaurosis or storage disease, characterized through biopsy as a pulmonary granulomatosis not as yet distinguishable from Boeck's sarcoid. As a result of Bergmann's studies[1,2] it is likely that thesaurosis is caused by hair sprays which in the last 10 years have come into extensive use in the bouffant hair styles which require some form of immobilization of the tresses.

The best known ingredient in sprays aside from freon, ethyl alcohol, lanolin or perfume is the synthetic resin polyvinyl pyrrolidone (P.V.P.). This substance, which has been used as a plasma expander in many subjects intravenously without producing disease, is a macromolecule which is not metabolizable. When inhaled, the material accumulates in the macrophages and is retained by the reticulo-endothelial system for unknown periods. The material also can reach the pulmonary alveoli[3] and can produce extensive bilateral pulmonary infiltrates with hilar adenopathy. When inhalation is discontinued, moderate degrees of clearing of the infiltrate promptly occurred.[1,2]

Subcutaneous injection of a hair spray residue into the inaguinal area of guinea pigs resulted in a granulomatous reaction characterized by the presence of granules that stained with the periodic acid-Schiff reagent (PAS) in macrophages at the site of the injection, and granule laden macrophages were also found in other parts of the reticulo-endothelial systems. This is comparable to what was found by Bergmann on biopsy of scalene nodes of patients that had developed pulmonary infiltrates after intensive inhalation of the hair spray. Many of the patients Bergmann reported have used hair sprays as often as 15 times daily, and a hairdresser would in all likelihood also have as much as 30 or more exposures daily. The probability of inhalation of significant amounts of this material in the course of a few weeks or months seems well established in view of the measurements made by Draize et al[3] who determined that after a ten second spray of P.V.P. type of preparation in an enclosed space, 130 micrograms of the dry residue is available for inhalation in the next 5 minutes.

Reproduction of the human lesions in the rabbit exposed to hair spray inhalation has thus far failed. Positive results would of course be highly desirable as additional evidence of the causation of the human lesions by this material. However, the failure in the rabbit does not constitute proof that the material is harmless in man, or in other species. Certainly there must be differences in susceptibility between species. Furthermore there must be marked differences in susceptibility between individuals of the same species as is frequent in reactions to other drugs. It would hardly be possible for so many women to have used hair sprays for long periods without any more cases of thesaurosis coming to light than the 15 thus far reported.[1,2] It is quite likely that in addition to significant amounts of inhalation, a high susceptibility is necessary to produce the lung lesions. It also must be realized that probably many cases have thus far been missed because of the relative non-specificity of the clinical picture and also because of the failure of physicians to ask questions regarding exposure to hair sprays.

Thus far the attempts to demonstrate P.V.P. or related compounds in the lungs by chemical means were unsuccessful. Absolute proof of an etiologic relation between the inhalation of hair sprays and thesaurosis must therefore await the development of better techniques for identifying the offending agent in the tissues. Nevertheless there is a strong assumption that such an etiologic relation does exist. It is based on proof that significant amounts of hair spray materials can be inhaled; that a recognizable clinical and pathological picture is associated with exposure to inhalation of hair spray; that termination of such exposure in time will in many cases result in clinical improvement to the point of disappearance of the radiologically identifiable lesions; and finally that the autopsied cases attest to the severity that the lesions can apparently attain in some exposed cases.

Schepers[4] has recognized a close histologic similarity between sarcoidosis and thesaurosis, and has raised the question as to whether some of Bergmann's cases of thesaurosis may not after all be instances of pulmonary sarcoidosis coincidental to exposure to cosmetic hair sprays. However, the evidence presented by Bergmann cannot be passed off lightly, especially since death may have occurred on the basis of hair spray toxicity. The fact is that hair sprays represent a group of cosmetics currently under suspicion for their toxicologic properties and careful scrutiny of the medical problem by the medical profession and by the cosmetic industry is needed.

L.H.N.

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THE PRESIDENT'S PAGE

Good health is man's greatest asset. It is the responsibility of the medical profession to assist in the development of good physical and mental health. The physician assumes a great responsibility and he develops a reputation depending on his sincerity of purpose and his relationship to his patient. By sound scientific practice he establishes a favorable status among his colleagues. By his friendly words and his satisfying treatment to his patient he gains the confidence of the public. Venerated for his acts of kindness and words of encouragement he still attempts to press a code of ethics in his profession and pour out the milk of human sympathy. Try as hard as we can to keep the perspective of the practice of medicine good, we are disturbed to learn that the confidence in the doctor by the lay people is partially fragmented. This is a stinging blow to the dedicated physicians.

During the past two or three decades medical therapy has changed with the advancement of medical science. Doctors have changed, some have become careless, charge too high a fee, show little sympathy for their patients, or being in a hurry, speak too quickly and unsympathetically. The patient is left in a freezing atmosphere. The good physician-patient relationship evaporates and the art of the practice of medicine fades.

There are many reasons for defacing the dignity of the medical profession. One of these may be modern science. Has medical science, cold as it is, overshadowed human feelings? In fact science has become a deity for some physicians. Would that such physicians read Sir Julian Huxley's "The Humanist Frame" and cogitate a while on humanism and the art of medicine? Another reason raised for an excuse for the loss of art in the practice of medicine has been the selection of all A medical students rather than the selection of some B students with high ideals, conscious of their surroundings and eager to expend a kindliness to humans. The patient, rich or poor, longs for sympathy as well as adaptation of modern scientific medicine.

The deficiencies in the practice of the art of medicine are not irrevocably lost. That they are sadly lacking in some spheres of medical practice is the fault of the doctor and the profession must correct them. To be sure the doctor must be scientific; but he must be human too. He has the right to maintain his individualism. He must prevent medical practice from being subservient to cold science, to government control or to any state organization as long as he is willing to cooperate with these agencies to effect professional dignity. By practicing the arts of medicine and improving the physician-patient relationship much can be done to restore confidence in physicians.

"Wherever the art of medicine is loved, there
also is love of humanity."

Clyde L. Deming, m.d.

FROM THE GENERAL MANAGER'S OFFICE

William R. Richards, m.d., *General Manager*
160 St. Ronan Street, New Haven, Conn.
Telephone 865-0587

James G. Burch
Director of Public Relations

Josephine P. Lindquist
Assistant to General Manager

CALL

ANNUAL MEETING OF THE HOUSE OF DELEGATES

The 1963 Annual Meeting of the House of Delegates will be held at the Statler-Hilton Hotel, Hartford, commencing at 10:00 o'clock in the morning of Tuesday, April 30.

Following luncheon, the House will reconvene for the completion of business.

Clyde L. Deming, President
Michael R. Scully, Speaker of the House
Orvan W. Hess, Secretary

INTRODUCTION OF RESOLUTIONS

Article V, Section 12, Par. 3 of the Bylaws of the Society provides that:

All resolutions to be considered as regular business at any regular meeting of the House of Delegates must be in the hands of the Speaker not later than seventy-two hours before the opening of that meeting. All resolutions and recommendations published in the official agenda distributed to the members of the House prior to the meeting at which action is to be taken shall be considered as regular business. Resolutions presented later than seventy-two hours before the opening of a meeting will be referred for consideration as regular business by the House only when they are presented by the Council or accepted for consideration by majority vote of the delegates present. Any resolution which does not qualify in accordance with the aforesaid provisions for consideration as regular business may be accepted for action by a majority vote of the delegates present and, if so accepted, shall be referred at once by the Speaker to a reference committee. Any such reference committee shall consider resolutions referred to it and shall report, with recommendations, to the House before adjournment of the meeting.

COUNCIL MEETING

SUMMARY OF ACTIONS

February 20, 1963

I. Attendance

Present in addition to Dr. Gilman, the Chairman, were: Drs. Pitock, Hess, Weise, Sr., Cullen, Gardner, Scully, Wilson, O'Connor, Bradley, Grendon, Grant, Davis, Dean, Weber, Martin, White, Egan, Abbot, H. Caplan, Hastings. Also present: Mrs. Josephine P. Lindquist, William R. Richards. Absent were: Drs. Deming, Goldberg, Cornwell, Murray, Jr., Hughes, Chartier, Gevalt, Phillips, Beardsley.

II. Routine Business

Approval Of Minutes

It was VOTED to approve the minutes of the meeting of January 24, 1963, as printed and distributed.

Life Members

It was VOTED to approve applications for Life Membership for eligible Active Members as follows: David Freeman, New Haven; Thomas J. Sullivan, New Haven; William J. Bodie, Branford; Israel A. Blodinger, New Haven; Barnett Greenhouse, New Haven; Nathaniel C. Robey, Newton, (Bound Brook, N.J.); Louis O'Brasky, New Haven; Marcus Backer, Bridgeport; Michael M. Devenis, Santa Monica, California (NH); James C. Fox, Jr., Hartford; Joseph Kaschmann, Hartford; Raymond S. Keefe, Hartford; Winthrop P. Partridge, W. Hartford; Eric M. Simmons, Southington; Walter Weisenborn, Hartford; Louis Antupit, Hartford; David M. Caldwell, Manchester; Charles W. Goff, W. Hartford; Joseph Heyman, Hartford; Foster E. Priddy, Vernon; Ralph E. Kendall, W. Hartford; Lawrence A. Cushman, W. Hartford; F. Earle Kunkel, Hartford; David A. Garbelnick, Bridgeport.

Exemptions From 1963 Dues

(a) It was VOTED to exempt Allan M. Ross, Darien, from payment of 1963 CSMS dues for the reason of physical disability.

(b) It was VOTED that, upon receipt of notice from the Fairfield County Medical Association of similar action, the 1963 CSMS dues of Francis M. Burns, Shelton, (deceased 2/15/63) be remitted to his widow, Mrs. Mildred H. Burns.

Consultants To State Health Department

At the request of Franklin M. Foote, Commissioner, it was VOTED to appoint three consultants to advise the State Department of Health on plans for a project on "controlling health problems of the aged and the prevention of chronic diseases," such consultants to be without authority to commit the Society to approval or disapproval of such a plan, and to request the appointees to report to the Council on their participation in the planning of this project.

The three consultants appointed were:

Norton G. Chaucer, Hartford—Committee on Public Health

Ronald S. Beckett, Hartford—Cancer Coordinating Committee

Kurt J. Pelz, Wallingford—Committee on Aging

Resignation—Committee On AMA-ERF

It was VOTED to accept, with regret, the resignation of Walter P. Kosar, Hartford, as Chairman of the Committee on AMA-ERF, and it was further VOTED to appoint Peyton H. Mead, Hartford, as Chairman to replace Dr. Kosar and to complete his unexpired 1962-63 term.

Committee To Study Maternal Mortality And Morbidity

It was VOTED to direct the General Manager to inform the Chairman of the Committee that guest consultants to Committee meetings may be invited at will.

Resignation—Committee On Accident Prevention

It was VOTED to accept the resignation of Phillip D. Henry, Derby, as a member of the Committee on Accident Prevention.

Resignation—Committee On Public Health

It was VOTED to accept the resignation of John B. LeRoy, Storrs, as a member of the Committee on Public Health.

Election Of Student Member

It was VOTED to elect David H. Chepovsky, 52 Hickory Street, West Haven, to Student Membership. Mr. Chepovsky is attending Albany Medical College—Class of 1966.

Date For Next Council Meeting

The date of the next meeting was set for Thursday, March 21, 1963.

III. Old, New And Special Business

Connecticut Medical Service, Inc.

(a) Five legislative bills, now before the General Assembly, were reviewed and acted upon as follows:

S.B. 579—An Act concerning the Authority of Hospital Service Corporations.

S.B. 683—An Act concerning the Authority of Medical Service Corporations.

It was VOTED to oppose both these bills.

H.B. 3383—An Act concerning the Taxation of Medical Service Corporations.

It was VOTED to oppose this bill.

H.B. 3435, H.B. 3244—Related Acts concerning Representation of Laymen on the Board of Directors of Medical Service Corporations.

It was VOTED to oppose both these bills.

(b) Having received notice that the Medical Advisory Committee of CMS, Inc. had made recommendations as to the chairmanship and vice-chairmanship of the MAC, and notice that the CMS component of the Liaison Committees endorses the recommended nominations for these posts, it was VOTED to inform the President of CMS, Inc. that the CSMS component of the Liaison Committees also endorses these nominations as follows:

For Chairman of MAC—Allan J. Ryan, Meriden.

For Vice-Chairman of the MAC—Francis Gallo, Winsted.

It was VOTED that, upon receipt of official written notification of a reported action of the CMS Corporators on February 19, 1963, the Chairman of the Council seek to arrange a joint meeting of the Liaison Committees to obtain information concerning the action of the Corporators with respect to physicians nominated by the Council for election as CMS Directors.

Life Membership

Having noted that a very considerable number of applications for Life Membership are being received, month after month; that many of the physicians making application are still engaged in active practice; and that the continued waiving of dues for such an apparently large segment of the membership might jeopardize the financial stability of the Society under the present dues structure, it was VOTED to refer to the Subcommittee to Study and Revise the Bylaws the question as to whether eligibility for Life Membership should be made somewhat more stringent, particularly for members who are regularly engaged in active practice.

Statewide Hospital Planning

Having reviewed a copy of a letter (Dr. Deming's) from Governor Dempsey to Dr. A. W. Snoke, Chairman of the Governor's Committee on Statewide Hospital Planning, in which the Governor stated that he believed activity in this area should not be initiated by himself or the legislature but through the voluntary participation of all interested health agencies throughout the State, it was VOTED to request the Committee on Hospitals to seek discussion with representatives of the Connecticut Hospital Association on the subject of hospital planning as a start toward complying with the Governor's suggestion.

The Corporate Practice Of Medicine

Notice was made of the following:

(a) The county medical associations of Windham, Tolland, Litchfield, New London, New Haven and Middlesex have assured the Council of their basic agreement with the Council's intent to take suitable action with respect to the corporate practice of medicine by hospitals. The Fairfield and Hartford Associations still have the matter under consideration.

(b) It was VOTED that the Chairman appoint a Committee of the Council to receive information and advice from the AMA and other sources on the corporate practice of medicine by hospitals, and to prepare a possible course of action in this matter for presentation to the Council. The Chairman announced that he would assign these additional duties to the Special Committee appointed by the Council on December 19, 1962, which is to "study developments on the corporate practice of medicine . . . and to report on these matters at each meeting of the Council." The membership of the Special Committee is as follows:

Jachin B. Davis, New Haven, Chairman
David A. Grendon, Sharon
Phillip M. Cornwell, Hartford
David S. Hastings, Stafford Springs

Invitational Workshop On Hospital Emergency Rooms

Having been advised by the General Manager that he had received an invitation from T. Stewart Hamilton, Executive Director of the Hartford Hospital, to attend and participate in a Workshop on hospital emergency room units in Hartford on April 26-27, 1963, and having received the General Manager's opinion that other members of the Society could undoubtedly contribute more to such a Workshop than himself, it was VOTED to request Dr. Hamilton to extend invitations to this meeting to the following:

Stevens J. Martin, Hartford
Leopold M. Trifari, New Haven
Malcolm S. Beinfield, Westport
and, if possible, to all members of the CSMS Committee on Hospitals

N.B. *The foregoing is a summary of the proceedings and actions of the Council on February 20, 1963. Detailed minutes of the meeting are on file at 160 St. Ronan Street, New Haven, for perusal by any interested member of the Society.*

HOW ABOUT
YOUR
CONDITION,
DOCTOR?

Everyone knows that doctors, occupied with the care of others, very often ignore their own health and well-being.

Let's look at some facts contained in a 13-year study of the estates of members of the Hartford County Medical Association. First, the study showed that doctors between the ages of 41 and 50 die at a rate twice that of the general population; and that the death rate for doctors between 61 and 70 is half again as much as that shown in standard insurance mortality tables.

Think of the surviving family members. The survey found that of the 144 deceased doctors included in the study:

- *34% had left no will*
- *13% were in debt at the time of death*
- *31% left net estates of less than $10,000*
- *62% were survived by their wives and families.*

Is this what you'd prescribe for *your* family?

Our Trust Department can help you provide for your family's future financial security by coordinating all your family assets—life insurance, real estate, securities and savings—into a single, private arrangement that not only minimizes estate settlement expense and delay, but provides a permanent yet flexible plan—including the possibility of attractive tax savings. Call or write Mr. William Dickinson at the Trust Department of our Main Office, 36 Pearl Street in Hartford, and arrange for a confidential discussion. It could be one of the most important appointments you'll ever make.

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Ogelsby Paul, University of Illinois School of Medicine, Chicago; Howard B. Sprague, Massachusetts General Hospital, Boston; Shields Warren, Harvard Medical School at the New England Deaconess Hospital, Boston.

ATTEND THESE IMPORTANT GENERAL SESSIONS

MONDAY, MAY 13

2:00-4:30 P.M.—Advances in Drug Therapy And Current Attitudes Toward Newer Medications.

TUESDAY, MAY 14

9:30 A.M.-NOON—What Can The Family Doctor Do To Aid In Cancer Control?

WEDNESDAY, MAY 15

2:00-4:30 P.M.—Management Of The Complications Of Atherosclerosis From The Biochemical Approach To The Patient As A Whole.

THURSDAY, MAY 16

2:00-4:30 P.M.—Coronary Thrombosis: Management From The Prodromal Through Rehabilitative Stages.

FRIDAY, MAY 17

9:30 A.M.-NOON—Radiation Effects And Safe Procedures In Medical Radiation.

Plus 23 Scientific Section Meetings And Many New Scientific Exhibits

FOR COMPLETE PROGRAM DETAILS, WRITE NEW YORK MEDICAL MEETING, MEDICAL SOCIETY OF THE STATE OF NEW YORK, 750 3RD AVENUE, NEW YORK 17, N. Y.

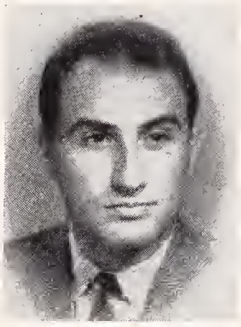
171th ANNUAL MEETING
of the
CONNECTICUT STATE MEDICAL SOCIETY

Statler-Hilton Hotel
10 Ford Street, Hartford, Connecticut

April 30, May 1, 2, 1963

PROGRAM COMMITTEE

Harvey W. Kaetz, *New Haven, Chairman*
Allen M. Margold, *Norwalk*
Peter J. Scafarello, *Hartford*



Harvey W. Kaetz
New Haven

FOREWORD
The Annual Meeting

Organized in 1792 as the Connecticut State Medical Society, this association's annual meeting has been a fixture on the spring medical scene for many years. Although the Society is 171 years old, this year's annual meeting, listed as the 171st, is undoubtedly not. At least one meeting was not held during World War II and there probably have been other years in which no meeting was held.

We do, however, have a distinguished and proud heritage and a loyal membership. There are times when one might wish for a manifestation of that loyalty perhaps shown by better attendance figures at meetings and this is one of those times.

Last year's meeting, our first at the Statler, was attended by 873 members. This number represented somewhat more than 25 per cent of our total roster of 3,396 physicians. This year, your program committee is attempting to make better use of the facilities and trusts many more of you will enjoy the varied clinical fare and the opportunity to socialize with your fellow M. D.'s.

The place is the Statler Hilton Hotel in Hartford and the dates are April 30, May 1, 2, 1963. The detailed program follows:

Harvey W. Kaetz,
Chairman, Program Committee.

GENERAL INFORMATION
Read Carefully

REGISTRATION:

The registration desk will be located on the mezzanine floor and everyone attending the meeting is requested to register. There will be no charge for registration and all members of the Society will be given a guest luncheon ticket when and only if they register.

PARKING:

There are ample parking facilities at the hotel and in the surrounding area. If you wish, you may drive up to the door of the hotel and an attendant will park your car for you.

TELEPHONE:

Telephone messages will be received at Hartford 249-5611.

LUNCHEONS:

Luncheons will be served in the City Rooms on the Mezzanine on May 1 and 2 and ALL MEMBERS OF THE SOCIETY REGISTERING WILL BE THE GUESTS OF THE SOCIETY. PLEASE REMEMBER, A LUNCHEON TICKET WILL BE GIVEN TO MEMBERS ONLY IF THEY REGISTER.

HOTEL ACCOMMODATIONS:

Persons who wish to remain overnight should make reservations not later than two weeks prior to opening date of the meeting. Reservations will be held until 6:00 P.M. on the day of arrival unless later hour is specified. Please indicate in your letter that you are attending the Connecticut State Medical Society Meeting. Your letter should be directed to the Front Office Manager, Statler-Hilton Hotel, 10 Ford Street, Hartford 3, Connecticut. Special reservation cards are available in the Society office and will be mailed to members upon request.

ANNUAL DINNER:

The Annual Dinner will be held at the hotel on Wednesday, May 1, 1963. The social hour will be at 6:15 P.M. and the dinner at 7:00 P.M. All persons attending the dinner will be the guests of the Society at the social hour which will begin *promptly* at 6:15 P.M. and end *promptly* at 7:00 P.M. Your reservation for dinner should be sent in as soon as possible.

PROGRAM:

General scientific sessions will be held in the terrace room from 9:30 A.M. to 3:30 P.M. Section meetings will begin at 3:30 P.M. and will be held in the rooms listed in the program.

EXHIBITS:

The technical exhibits will be located in the ballroom. Physicians should take advantage of the opportunity to review "under one roof" what is new and timely in the goods and services available to the Connecticut physician.

PROGRAM

Tuesday, April 30

MEZZANINE

Annual Meeting of the House of Delegates

MICHAEL R. SCULLY, *Bridgeport, Speaker of the House, presiding*

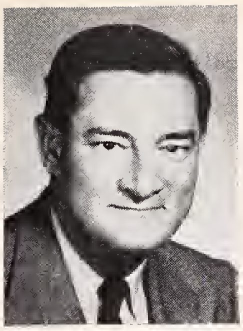
10:00 CALL TO ORDER

BUSINESS SESSION

1:00 LUNCHEON FOR OFFICERS, MEMBERS OF THE HOUSE AND GUESTS

2:00 RESUMPTION OF BUSINESS

Social hour immediately following the adjournment of the meeting



Julius L. Wilson
New York City

William Hollingsworth
New Haven

Ernest L. Wynder
New York City

Wednesday, May 1

9:00 Registration—Mezzanine

Terrace Room

9:30 Call to Order—Morris P. Pitock, Bridgeport, President of the Society
Address of Welcome—Benjamin V. White, Hartford, President, Hartford County Medical Association

Arnold B. Rilance, *New Haven, presiding*

9:45 Pulmonary Emphysema
Julius L. Wilson, *New York City; Director of Medical Education, American Thoracic Society, New York City*

10:30 Rheumatoid-like Arthritis Associated with Other Diseases
William Hollingsworth, *New Haven; Associate Professor of Medicine, Yale University School of Medicine; Attending Physician, Grace-New Haven Community Hospital*

11:10 Intermission to Visit Technical Exhibits

11:40 An Evaluation of the Tobacco-Cancer Relationship
Ernest L. Wynder, *New York City; Head, Section of Epidemiology, Sloan-Kettering Institute; Associate Professor, Cornell University Medical College*

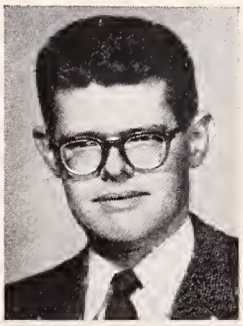
12:20 Cancer of the Uterine Cervis and Corpus in Connecticut (Epidemiology)
Presented by: John C. Bailar, III, *Bethesda, Maryland; Senior Surgeon, National Cancer Institute; Lecturer in Public Health (Statistics), Yale University School of Medicine*
(Authors: John C. Bailar, III, Louis B. Thomas and Andrew D. Thomson.)
(Program arranged with Section on Pathology)

1:00 Luncheon—City Rooms
Intermission to Visit Technical Exhibits

Harvey W. Kaetz, *New Haven, presiding*

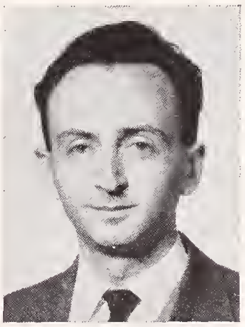
2:00 Clotting Tests of General Application
James L. Tullis, *Boston; Chairman, Department of Medicine, New England Deaconess Hospital; Director of Cytology Division, Protein Foundation, Boston*

2:40 Deciphering the Genetic Code
Peter Lengyel, *New York City; Instructor, Department of Biochemistry, New York University School of Medicine*



John C. Bailar, III
Bethesda, Maryland

James L. Tullis
Boston, Massachusetts



Peter Lengyel
New York City

Wednesday, May 1

MEETINGS OF SECTIONS OF THE SOCIETY AND GUEST ORGANIZATIONS

WOMAN'S AUXILIARY TO THE CONNECTICUT STATE MEDICAL SOCIETY

19TH ANNUAL MEETING — SHOREHAM MOTOR HOTEL, HARTFORD

President: Mrs. Norman H. Gardner, *East Hampton*
Recording Secretary: Mrs. James F. Jones, *Danielson*
Corresponding Secretary: Mrs. Harry C. Knight, *Middletown*

10:30 REGISTRATION
11:00 BUSINESS MEETING
12:30 HOSPITALITY HOUR
1:00 LUNCHEON

Guest Speaker

NUTRITION—FACT, FANCY AND FOOLISHNESS

FREDRICK J. STARE, M.D., *Professor of Nutrition and Chairman, Department of Nutrition, Harvard School of Public Health, Boston*

SECTION ON DERMATOLOGY

3:30 Room 424

President: Charles W. O'Neil, *Hartford*
Secretary: Patrick N. Brown, *Meriden*

HISTOPATHOLOGY OF THE CONNECTIVE TISSUE TUMORS, NEVI AND NEVOID TUMORS AND EPITHELIOMAS

WILBERT SACHS, *Passaic, New Jersey; Director, Dermatology, Passaic General Hospital*

SECTION ON GASTROENTEROLOGY

3:30 New York-Washington Rooms

President: Frank K. Abbot, *Waterbury*
Secretary: Vincent A. DeLuca, Jr., *Derby*

PANEL—COLD IN THE TREATMENT OF PEPTIC ULCER

WILLIAM J. GRACE, *New York City; Director of Medicine, St. Vincent's Hospital; Professor of Clinical Medicine, New York University*

HAROLD G. BARKER, *New York City; Associate Professor of Surgery, Columbia University College of Physicians and Surgeons*

SECTION ON NEUROLOGY

3:30 Room 416

President: James C. Fox, Jr., *Hartford*
Secretary: John C. Moench, *New Haven*

TREATMENT OF CONVULSIVE DISORDERS

Panel discussion by members of the Section
Moderator: James C. Fox, Jr.

SECTION ON NEUROSURGERY

3:30 Room 420

Chairman: William B. Scoville, *Hartford*
Secretary: Franklin Robinson, *New Haven*

CLINICAL ASPECTS OF HERNIATED LUMBAR DISCS

IRVING J. SHERMAN, *Bridgeport; Attending Neurosurgeon, Bridgeport Hospital and St. Vincent's Hospital*

Wednesday, May 1

JOINT MEETING
SECTION ON OBSTETRICS AND GYNECOLOGY
CONNECTICUT SOCIETY OF AMERICAN BOARD OBSTETRICIANS AND GYNECOLOGISTS

3:30 Boston-Buffalo Rooms

President: Donald W. Morrison, *Manchester*
Secretary: James M. Bunce, *Hartford*

SEPTIC SHOCK

BRIAN LITTLE, *Boston; Associate in Obstetrics and Gynecology, Harvard Medical School*

CONNECTICUT SOCIETY OF PATHOLOGISTS

3:30 Room 436

President: Edward S. Breakell, *Stamford*
Secretary: Murray Z. Rosenberg, *Willimantic*
Program Chairman: Nilo E. Herrera, *Danbury*

CANCER OF THE UTERINE CERVIX AND CORPUS IN CONNECTICUT (PATHOLOGY)

Authors: Louis B. Thomas, John C. Bailar, III, and Andrew D. Thomas, *National Cancer Institute, Bethesda, Maryland. To be presented by* DR. THOMAS.

JOINT MEETING
SECTION ON PREVENTIVE MEDICINE AND PUBLIC HEALTH

Chairman: Clement F. Batelli, *New Haven*
Secretary: Mila E. Rindge, *Hartford*

SECTION ON OCCUPATIONAL HEALTH

Chairman: J. Howard Johnston, *Wethersfield*
Secretary: Preston Barton, *Meriden*

3:30 Room 408

YOU AND YOUR STATE LEGISLATURE

GLORIA SCHAFFER, *Woodbridge, Senator, 14th District, Connecticut*

SECTION ON UROLOGY

3:30 Room 412

Chairman: Sidney H. Beck, *Bridgeport*
Secretary: Elwood F. Ireland, Jr., *Bridgeport*

EXPERIENCES WITH ADRENAL SURGERY

LLOYD D. FLINT, *Boston; Urologist, Lahey Clinic.*

CONNECTICUT DIABETES ASSOCIATION

3:30 Room 440

President: Robert M. White, *New Haven*
Secretary: James C. Hart, *New Haven*

THE NEW AND THE OLD IN DIABETES MELLITUS

SAMUEL B. BEASER, *Boston; Clinical Associate in Medicine, Harvard Medical School.*

Wednesday, May 1

CONNECTICUT SOCIETY OF AMERICAN BOARD INTERNISTS

3:30 Room 404

President: Frederick A. Beardsley, Jr., *Willimantic*
Secretary: Stephen H. Deschamps, *Bridgeport*

SYMPOSIUM—AIR POLLUTION IN CONNECTICUT

Moderator: DONALD F. EGAN, *New Haven; Director, Inhalation Therapy Service, Grace-New Haven Community Hospital; Assistant Clinical Professor of Medicine, Yale University School of Medicine*

Speakers: CHARLES E. MCLEAN, *Hartford; Chief, Cardiorespiratory Laboratory, Hartford Hospital*—"CARDIORESPIRATORY DISEASES AND AIR POLLUTION."

Mr. MARVIN L. SMITH, *New Haven; Director, Bureau of Environmental Sanitation, New Haven Department of Health*—"PRACTICAL ASPECTS OF AIR POLLUTION CONTROL."

Mr. DAVID C. WIGGINS, *Hartford; Chief, Air Pollution, Housing Sanitation Section, Connecticut State Department of Health*—"SUBJECT TO BE ANNOUNCED."

Question and Answer Period to Follow.

CONNECTICUT ASSOCIATION OF MEDICAL RECORD LIBRARIANS

9:00 A.M. Shoreham Motor Hotel, Hartford

9:00 COFFEE AND REGISTRATION

10:00 BUSINESS MEETING
Miss EDITH MITCHELL, *President, presiding*

12:30 LUNCHEON

1:30 NATURAL HISTORY OF DISEASE AS REVEALED BY BIOCHEMICAL REPORTS ON THE MEDICAL RECORD
GEORGE N. BOWERS, JR., *Hartford; Department of Pathology, Hartford Hospital*

2:30 ILEAL BLADDERS
JAMES F. MCANDREWS, *Hartford; Assistant Visiting Staff, Newington Hospital for Crippled Children*

3:30 Visiting exhibits of the Connecticut State Medical Society meeting at the Statler-Hilton Hotel.

CONNECTICUT OCCUPATIONAL THERAPY ASSOCIATION

1:30

Veteran's Administration Mental Hygiene Clinic Day Center
10th Floor, 983 Main Street, Hartford

1:30 Tour of the Day Center

2:30 TREATMENT DEVELOPMENT IN A DAY CENTER
FRANK GEISER, *Hartford; Psychiatrist, Veteran's Administration Day Center*

Followed by discussion of questions from the floor by the Staff:

FRANK GEISER, *Psychiatrist*
PHILIP MORSE, *Coordinator*
FRED DICKERSON, *Psychologist*
Mr. WILLIAM HENNEGAN, *Social Service*
Miss JEAN ROYAL, *Occupational Therapist*

Wednesday, May 1

ANNUAL DINNER OF THE SOCIETY

STATLER-HILTON HOTEL
10 Ford Street
Hartford, Connecticut

Social Hour 6:15 P.M. Dinner 7:00 P.M.

PROGRAM

INTRODUCTION OF NEWLY ELECTED OFFICERS—RALPH L. GILMAN, *Storrs, Chairman of the Council*

MORRIS P. PITOCK, *Bridgeport, President, presiding*

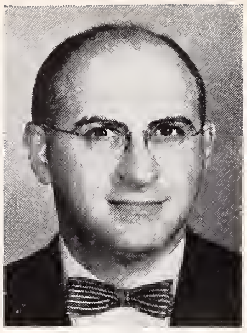
PRESENTATION OF GUESTS AND DELEGATES FROM STATE MEDICAL SOCIETIES

FIFTY YEAR MEMBERSHIP AWARDS

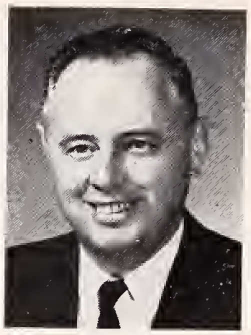
JOSEPH HORACE BEAUDRY, *Bridgeport*
ABRAHAM BERNSTEIN, *Bridgeport*
ELIOT SANBORN COGSWELL, *Hartford*
HENRY NICHOLAS COSTELLO, *Madison*
BENJAMIN BROOKS FINKELSTONE, *Bridgeport*
WILLIAM JOHN HENRY FISCHER, *Milford*
CLAUDE VINCENT FLAHERTY, *Hartford*
H. BERTRAM LAMBERT, *Southport*
ARTHUR BERNARD LANDRY, *Hartford*
JOHN FRANCIS O'BRIEN, *Waterford*
ARTHUR CHARLES SMITH, *Danbury*
FRANK EMERY WILSON, *Newington*

GUEST SPEAKER
To Be Announced

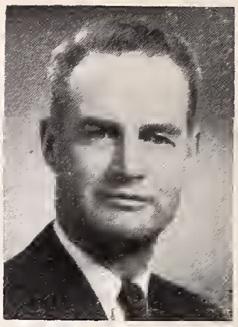
David A. Karnofsky
New York City



A. H. Russakoff
Birmingham, Alabama



William F. Enos
Arlington, Virginia



Richard Warren
Boston, Massachusetts

Thursday, May 2

9:00 Registration—Mezzanine

Terrace Room

Peter J. Scafarello, *Hartford, presiding*

9:45 Cancer Chemotherapy

David A. Karnofsky, *New York City; Associate Professor of Medicine, Cornell University Medical College; Attending Physician, Department of Medicine, Memorial Hospital for Cancer and Allied Diseases*

10:30 Delayed Effects of Somatic Radiation

William C. Moloney, *Boston; Professor of Clinical Medicine, Tufts University Medical School; Director of Hematology Laboratory (Tufts), Boston City Hospital*

(Program arranged with Connecticut Chapter- American Academy of General Practice)

11:10 Intermission to Visit Technical Exhibits

Allen M. Margold, *Norwalk, presiding*

11:40 Pulmonary Sarcoidosis

A. H. Russakoff, *Birmingham, Alabama; Associate Professor of Clinical Medicine, Medical College of Alabama; Consultant, Diseases of the Chest, Lloyd Noland Foundation*

12:20 Medical Legal Investigation of Automobile Fatalities

William F. Enos, *Arlington, Virginia; Pathologist, Northern Virginia Doctors Hospital; Associate Clinical Professor of Clinical Pathology, George Washington University; Medical Examiner Consultant and Designated Pathologist to the Chief Medical Examiner's Office, Northern Virginia Division*

(Program arranged with Association of Medical Examiners of Connecticut)

1:00 Luncheon—City Rooms

Intermission to Visit Technical Exhibits

PROGRAM ARRANGED WITH THE CONNECTICUT SOCIETY OF AMERICAN BOARD SURGEONS

President: Eugene J. Fitzpatrick, *New Haven*
Secretary: William T. Livingston, *New Britain*
Robert A. Chase, *New Haven, Program Chairman, presiding*

2:00-3:30 General and Peripheral Vascular Surgery—Case Presentations

Richard Warren, *Boston; Clinical Professor of Surgery, Harvard Medical School; Surgeon, Peter Bent Brigham Hospital; Chief of Cardiovascular Surgery, Veterans Administration Hospital, West Roxbury, Massachusetts*

The Connecticut Society of American Board Surgeons will have a social hour and dinner at the Shoreham Motor Hotel, 440 Asylum Street, Hartford, at 6:00 P.M. Following dinner, Dr. Warren will speak on "Academic Surgery in West Africa."

Thursday, May 2

MEETINGS OF SECTIONS OF THE SOCIETY AND GUEST ORGANIZATIONS

SECTION ON ALLERGY

3:30 Boston-Buffalo Rooms

President: Marvin Mogil, *New Haven*
Secretary: A. Arthur Fierberg, *Hartford*

Practicalities and Precautions in the Management of Allergic Children

Joseph Harman Fries, *New York City; Associate Clinical Professor, State University of New York, Downstate Medical Center College of Medicine*

SECTION ON ANESTHESIA

3:30 Room 424

President: Sawyer E. Medbury, *Willimantic*
Secretary: Sidney Chait, *Torrington*
Program Chairman: John E. Keet, *Waterbury*

3:30 Business Meeting

4:30 The Storage Lesion of Bank Blood—A New Approach

William S. Howland, *New York City; Chief of Anesthesia, Memorial Hospital for Cancer and Allied Diseases*

EYE, EAR, NOSE AND THROAT SECTION

3:30

President: Henry Merriman, *Waterbury*
Secretary: David W. Parke, *Meriden*

(There will be two separate programs, one for the Eye Group and one for the Ear, Nose and Throat Group.)

EYE SECTION—Room 440

Complicated Motility Surgery

Hunter H. Romaine, *New York City; Clinical Professor of Ophthalmology, New York University College of Medicine*

ENT SECTION—Room 436

Audiology in Otolaryngology

Robert F. Nagel, Ph.D., *New Haven; Clinical Instructor in Otolaryngology, Yale University School of Medicine*

SECTION ON ORTHOPEDICS

3:30

Hunt Memorial Building, 230 Scarborough Street, Hartford

President: Peter V. C. Dingman, *Waterbury*
Secretary: Anthony L. Camarda, *Bridgeport*

Management of Fractures of the Distal Metaphasis of the Tibia

Edwin F. Cave, *Boston; Chief of Fracture Service Emeritus, Massachusetts General Hospital*

Pros and Cons of the Intramedullary Nailing of Fractures of the Humerus

William R. MacAusland, Jr., *Boston; Assistant Orthopedic Surgeon, Massachusetts General Hospital; Instructor, Orthopedic Surgery, Harvard Medical School*

Thursday, May 2

SECTION ON PHYSICAL MEDICINE

3:30

Gaylord Hospital and Sanitorium, Wallingford

President: Sidney Licht, *New Haven*
Secretary: Otto Goldkamp, *Hartford*

Nerve Pressure Syndromes

A. T. Richardson, M.B., B.S., M.R., C.P., *D.Physical Medicine; Physician, Department of Physical Medicine and Rheumatology, Royal Free Hospital, London, England*

SECTION ON PROCTOLOGY

3:30 Room 420

Chairman: Abraham Markoff, *New Haven*
Secretary: Bernard J. Kaplan, *Hartford*

Is Ulcerative Colitis a Pre-Malignant Condition?

Arthur Gladstone, *Burlington, Vermont; Associate Professor of Clinical Surgery, University of Vermont College of Medicine*

CONNECTICUT DISTRICT BRANCH—AMERICAN PSYCHIATRIC ASSOCIATION

3:30 New York Room

President: Louis B. Fierman, *New Haven*
Secretary: Edward B. Swain, *Hartford*
Program Chairman: Harvey R. Wasserman, *Westport*

PSYCHIATRIST AND/OR VERSUS PHYSICIANS IN GENERAL HOSPITALS—PANEL DISCUSSION

Moderator: Louis B. Fierman, *New Haven*

Panel: Paul W. Dale, *Greenwich*
Thomas P. Detre, *New Haven*
Richard J. Newman, *Waterbury*
Harvey R. Wasserman, *Westport*
Benjamin Wiesel, *Hartford*

SECTION ON RADIOLOGY
RADIOLOGICAL SOCIETY OF CONNECTICUT, INC.

3:30 Room 412

President: Alfred J. Kummer, *New Haven*
Secretary: Wayne P. Whitcomb, *New Haven*
Program Chairman: Orlando F. Gabriele, *New Haven*

Pulmonary Angiography: Its Use in Diagnosis and as a Guide to Therapy in Lesions of the Chest

Richard G. Greenspan, *New Haven; Associate Professor of Radiology, Yale University School of Medicine; Director, Department of Radiology, New Haven Unit of the Grace-New Haven Community Hospital*

Thursday, May 2

ASSOCIATION OF MEDICAL EXAMINERS OF CONNECTICUT

3:30 Room 416

President: Samuel B. Rentsch, *Derby*
Secretary: F. P. A. Williams, *Stepney Depot*

The State Pathologist System of Virginia

William F. Enos, *Arlington, Virginia; Pathologist, Northern Virginia Doctors Hospital; Associate Clinical Professor of Clinical Pathology, George Washington University; Medical Examiner Consultant and Designated Pathologist to the Chief Medical Examiner's Office, Northern Virginia Division*

CONNECTICUT RHEUMATISM ASSOCIATION

3:30 Washington Room

President: Harold J. Lehmus, *Manchester*
Secretary: Harold S. Barrett, *Hartford*

Business Meeting

HEZEKIAH BEARDSLEY PEDIATRIC CLUB

3:30 Room 408

President: Robert P. Rogers, *Greenwich*
Secretary: Russell F. Colburn, *Stamford*

Business Meeting

CONNECTICUT CHAPTER OF NATIONAL ASSOCIATION OF SOCIAL WORKERS — MEDICAL SOCIAL WORK SECTION

12:15

Room 10, Mezzanine, Hotel Bond, Hartford

12:15 Social Hour and Lunch

1:30 Business Meeting

2:00 Panel—Family Centered Medical Care

Moderator: Louis Spekter, *Hartford; Chief, Maternal and Child Health Section, Connecticut State Department of Health*

Panel: Miss June Sokolov, O.T.R., *Director, Hartford Rehabilitation Center*

Miss Ann Robertson, M.S.W., *Pediatric Chief Social Worker, Grace-New Haven Community Hospital*

Exhibitors — 1963 Annual Meeting

Space	*Firm*	*Location*
1	Surgeons & Physicians Supply Company	Boston, Mass.
2	Roche Laboratories	Nutley, N. J.
3	Sandoz Pharmaceuticals	Hanover, N. J.
4	Merck, Sharp & Dohme	West Point, Pa.
5	Arthur W. Eade Insurance Agency	New Haven, Conn.
6	Eaton Laboratories, Div. Norwich Pharmacal Co.	Norwich, N. Y.
7	Mead Johnson Laboratories	Evansville, Ind.
8	Parke, Davis & Company	Detroit, Mich.
9	Group Insurers, Inc.	New Haven, Conn.
10	The Warren-Teed Products Company	Columbus, Ohio
11	J. B. Roerig and Company	New York, N. Y.
12	Professional Equipment Company	New Haven, Conn.
13	Brewer & Company, Inc.	Worcester, Mass.
14	Dome Chemicals, Inc.	New York, N. Y.
15	Medical Electronics Company	Auburn, Mass.
16	Schering Corporation	Union, N. J.
17	G. D. Searle & Company	Chicago, Ill.
18	Eli Lilly and Company	Indianapolis, Ind.
19	Desitin Chemical Company, Inc.	Providence, R. I.
20	Jacuzzi Research Inc.	Berkeley, Calif.
21	The Upjohn Company	Kalamazoo, Mich.
22	Pfizer Laboratories	New York, N. Y.
23	Burroughs Wellcome & Company, (U.S.A.) Inc.	Tuckahoe, N. Y.
24	Abbott Laboratories	North Chicago, Ill.
25	Smith, Kline & French Laboratories	Philadelphia, Pa.
26	Wampole Laboratories	Stamford, Conn.
27	King Merritt & Company, Inc.	Farmington, Conn.
28	Encyclopaedia Brittanica, Inc.	Chicago, Ill.
29	Ciba Pharmaceutical Products Company	Summit, N. J.
30	The S.E. Massengill Company, Inc.	New York, N. Y.
31	Educational Exhibit	
32	Polaroid Corporation	Cambridge, Mass.
33	Educational Exhibit	
34	Educational Exhibit	
35	Wallace Laboratories	Cranbury, N. J.
36	Westwood Pharmaceuticals	Buffalo, N. Y.
37	E. R. Squibb & Sons	New York, N. Y.
38	Dictating Equipment Corp.	Hartford, Conn.
39	Duke Laboratories, Inc.	So. Norwalk, Conn.
40	Claus Gelotte, Inc.	Cambridge, Mass.
41	Thermo-Fax Sales, Inc.	New Haven, Conn.
42	U. S. Vitamin & Pharmaceutical Corporation	New York, N. Y.
43	Carnrick Laboratories	Summit, N. J.
44	Burroughs Corporation	Hartford, Conn.
45	Organon, Inc.	West Orange, N. J.
46	Mutual of Omaha—United of Omaha	Hamden, Conn.
47	The D. G. Stoughton Company	Hartford, Conn.
48	Lederle Laboratories	Pearl River, N. Y.
49	Connecticut Medical Service	New Haven, Conn.

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Reimbursements up to $10,000.00. Deductible of $500.00, $750.00, or $1,000.00. Protection after retirement, coverage for widows and children in the event of prior demise of member. All dependent children can be covered regardless of age. This same broad coverage is also available for the first time to your employees and their families.

ACCIDENT AND HEALTH PLAN

In addition to the above, members up to age 40 may now purchase their Accident and Health protection at a 25% reduction in cost.

Through its continued official sponsorship of our Group Plans, The Connecticut State Medical Society has once again made it possible to offer broadened coverage under these two time-tested policies to members of the Society. If you are not now enrolled, do not turn your back on old friends who have served Connecticut physicians for over a quarter of a century. If a sufficient number of new applications are submitted for the Major Medical Expense Plan, all policies will be issued regardless of past medical history. For full information write or phone.

ARTHUR W. EADE, *Insurance*

185 Church Street, New Haven 10, Conn.

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Commercial Insurance Company

ANNUAL COUNTY ASSOCIATION MEETINGS

New Haven, Thursday, March 28

Waverly Inn, Cheshire

Business Meeting: 2:30 p.m. Dinner: 7:00 p.m.

Speaker: Mr. Edward Migdalski of Hamden. Mr. Migdalski is with the Oceanographic Department at Yale University.

Subject: EXPLORING BRITISH GUIANA AND THE AMAZON.

Hartford, Wednesday, April 3

Bond Hotel, Hartford

Business Meeting: 5:00 p.m. Dinner: 7:15 p.m.

Speaker: Dr. Homer D. Babbidge, Jr., President of the University of Connecticut.

Subject: THE ROLE OF THE MEDICAL SCHOOL IN A MODERN UNIVERSITY.

New London, Thursday, April 4

Norwich Inn, Norwich

Business Meeting: 5:30 p.m. Social Hour: 7:00 p.m.
There will be no speaker. Dinner: 8:00 p.m.

Fairfield, Tuesday, April 9

Stratford Motor Inn, Stratford

Business Meeting: 3:30 p.m. Dinner: 7:00 p.m.

Speaker: Austin Smith, M.D. of Washington, D.C., President of the Pharmaceutical Manufacturers Association and former Editor of the *Journal of the American Medical Association.*

Subject: GOVERNMENT VERSUS PEOPLE.

Litchfield, Tuesday, April 9

White Hart Inn, Salisbury

Business Meeting: 5:30 p.m. Cocktails: 7:00 p.m.
Dinner: 7:30 p.m.

Speaker: Robert M. Miller, M.D., President, Litchfield County Medical Association.

Subject: MEDICAL ETHICS, INDIVIDUAL AND GROUP MORALITY.

Middlesex, Thursday, April 11

Middlesex Memorial Hospital, Middletown

Business Meeting: 4:30 p.m. No Dinner.

Tolland, Tuesday, April 16

Old Homestead Inn, Somers

Business meeting will follow dinner. Dinner: 6:30 p.m.

Speaker: Mr. W. J. Godfrey Gourley, Management Consultant, Medical Business Management, Manchester, Connecticut.

Subject: PROS AND CONS OF CORPORATE PRACTICE OF MEDICINE.

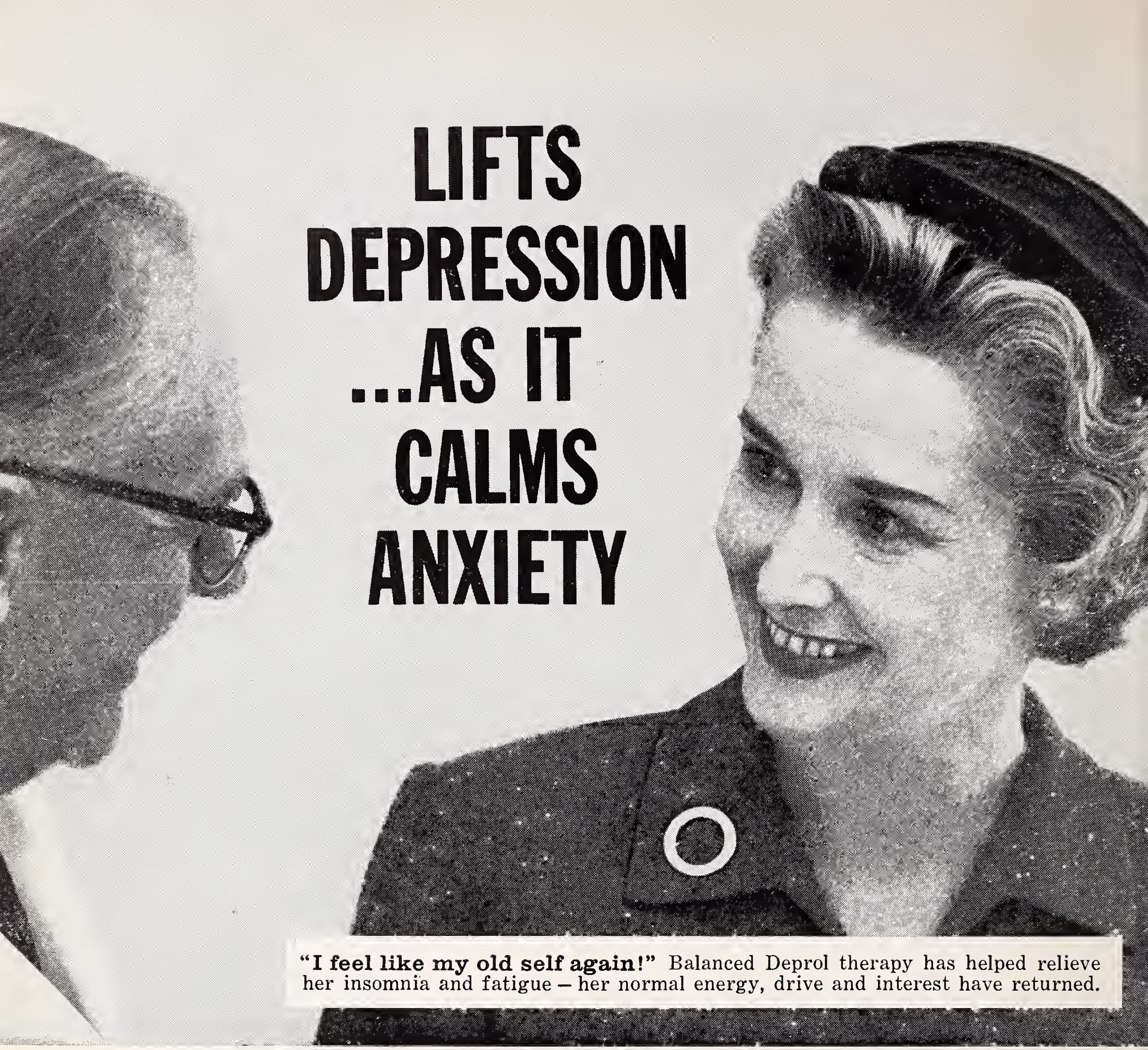
Windham, Thursday, April 25

Vernon Stiles Inn, Thompson

Business meeting will follow dinner. Cocktails: 6:30 p.m.
Dinner: 7:00 p.m.

Speaker: Donald Shedd, M.D., Associate Professor of Surgery, Yale University School of Medicine, New Haven, Connecticut.

Subject: EXPERIENCES ABOARD THE U.S.S. HOPE.



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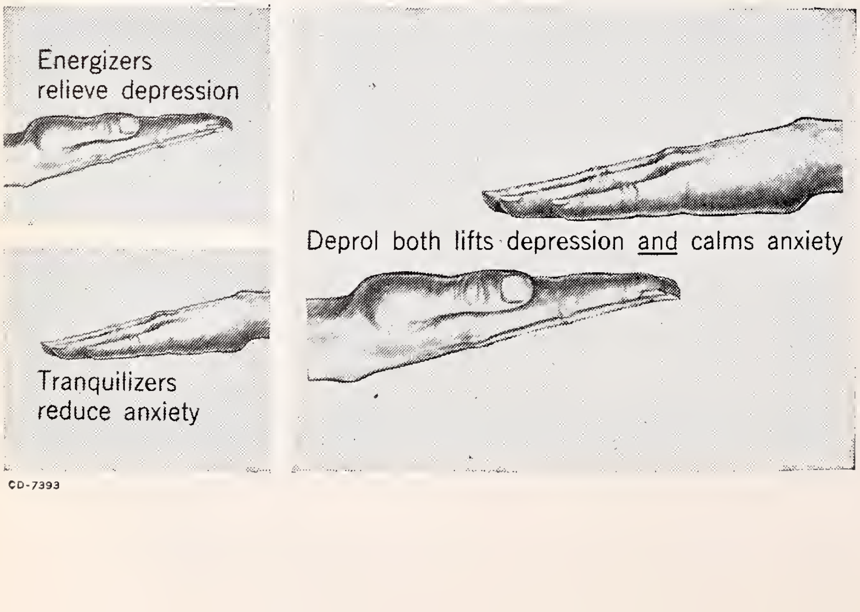

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Letter To The Editor

To The Editor:

Hartford, February 27, 1963

In view of Dr. Boatman's recent article in Connecticut Medicine concerning teenage smoking, I thought perhaps some of our colleagues might be interested in the work we are doing in Wethersfield.

About one year ago, five physicians—residents of Wethersfield—decided to see what they could do to deter smoking among Wethersfield children. These physicians—a pediatrician, a general practitioner, a general surgeon, an internist, and an otolaryngologist—met and formulated a plan of action which was approved by the Board of Education and endorsed by the school health department. The group then presented its ideas and offered its services in a meeting with the curriculum coordinators, school principals, and science teachers. These professional educators had been in close contact with teenage smoking for a long time and were fully convinced that it was a real and increasing problem. They were enthusiastic about the willingness of these physicians to take part in an educational program, though, I believe they harbored a few reservations about the doctors' ability to establish a satisfactory classroom rapport.

It was the opinion of the educators that a concerted effort should be made at the pre-high school level before habituation to cigarettes begins. The high school student does not present a lost cause, but he certainly would be a hard nut to crack without a pre-high school exposure to the fact that smoking was a health hazard. As a corallary it was the concensus that the lower grade students would discuss what they learned with their parents and might even induce them to take a positive interest in smoking and health.

The doctor-group aiming at the pre-high school age level began gathering facts and figures, medical and lay articles, cartoons, clippings, charts, leaflets, and posters. Slides were made for the projection of graphs, pictures, written material, x-rays, laboratory procedures, and even pathological material and sick patients.

To be most effective it was felt that the thought of "no smoking" should be instilled and revived repeatedly in the mind of each youngster during the next few years. It would evoke only a passing consideration if presented once in a large auditorium meeting and then dropped. Schedules were then worked out in each of six elementary schools wherein the physician would become the teacher in routine classroom sessions with about 30 students at a time. Each doctor planned and prepared his own method of presentation, but certain generalities were agreed upon within the group such as:

1. There should be no preaching, nothing from which one could infer a moral condemnation of smokers or smoking.
2. One should be careful not to instill the fear that smoking imposed a threat of imminent incurable disease or death for all smokers.
3. Approach the youngsters as maturing young people, offering them information for thoughtful consideration.
4. Discuss respiratory and cardio-vascular abnormalities, cancer in general, lung cancer in particular, g.i. disturbances and other disorders as you wish; then point out the statistical evidence implicating cigarette smoking.
5. One should ridicule cigarette advertising, which is designed to entice the teenager by associating cigarettes with sports and manliness, glamour and romance.

Since beginning this project last fall, one of the doctor group has met with the sixth grades in each of the six elementary schools. In each instance, a 30-40 minute presentation was followed by a question and answer period, which had to be terminated with many hands still upraised. This constituted an introduction to the subject for about 350 students.

In the junior high schools the doctors made a total of 24 seventh grade classroom appearances. Each science class with approximately 30 students was "hit" twice. The first meeting with each class was devoted to general discussion pertaining to smoking, using visual aids from the doctors' collection. The second period was utilized for showing the American Cancer Society film strip "To Smoke or Not to Smoke," followed by a 20 minute question and answer period. Leaflets with the same title furnished by the Cancer Society were made available (they were not handed out) and the rapidity with which they disappeared attested to the student interest in the subject. In these meetings about 375 children received instruction.

Next, with the help of a professional advertising man, a very simple carefully worked out anti-smoking display was produced and put in show cases at each junior high school. These stayed for two weeks, thereby reviving again the anti-smoking idea.

Next month, March, the doctors will meet with the 350 eighth grade students in the same way. Materials for reading will be placed in each school library while the display moves to the senior high school.

Finally, in April and May, all seventh and eighth graders, along with the ninth grade students, in combined auditorium meetings will see the Cancer Society moving picture film pertaining to cigarette smoking by teenagers. There will be only two of these meetings, but at each a physician will introduce the subject and answer questions for a limited time.

The regular classroom science instructors will follow up the doctor-meetings with additional information and discussion of smoking, along with required teaching concerning alcohol and narcotics.

As to the future—each year from now on, we hope to "hit" each child in the sixth grade before he moves into junior high school with physician prepared material. In the seventh grade he will be shown the Cancer Society film strips in classroom programs with a physician present. In the eighth and ninth grades the subject will be revived again by science teachers and by auditorium moving pictures.

Surveys are being made now concerning smoking in the twelfth grade and will be repeated each year. We hope to see significant decline in the incidence of smoking among high school seniors in three to four years.

So far the response from children, teacher, and parents has been gratifying. The doctors would welcome any material or specific suggestions from anyone interested in reducing what we believe is a major health hazard.

Edward H. Truex, m.d.

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Annual Meeting – May 1, 1963

The Shoreham Oaks
440 Asylum Street, Hartford

Items Of Note

The Fairfield County Auxiliary has become the second county in the state to vote to include the cost of the NATIONAL BULLETIN with their annual dues, beginning in 1963-64.
Dr. Frederick Stare is to be the speaker at the annual Auxiliary luncheon meeting on May 1st.

The film MEDICINE MAN is now available for use by auxiliaries.

The fortieth annual convention of the Woman's Auxiliary to the American Medical Association will be held June 16-20, 1963 in Atlantic City, New Jersey. Headquarters will be Haddon Hall, Atlantic City, New Jersey.

The AMAERF state chairman, Mrs. Winfield E. Wight, now has stationery for sale to members, the sale of which helps support the purposes of the American Medical Association Education and Research Foundation.

The printing of the HANDBOOK FOR GUIDANCE COUNSELORS by the Health Careers Committee was recently authorized by the Council of the Connecticut State Medical Society. Distribution was to begin in March.

THE CONNECTICUT PHYSICIANS' ART ASSOCIATION WILL NOT HOLD THEIR ART EXHIBIT THIS YEAR. IT IS PLANNED TO RESUME THIS EXHIBIT NEXT YEAR.

Safety

Each County Chairman should establish contact with the Safety Council in her community. Find out if the safety needs have been surveyed officially. If not, work with officials and community leaders toward establishing a Safety Council. Point out that safety is everybody's business, and encourage involvement of as many people as possible. Business and industry will cooperate. Safety education and engineering hold down industrial accidents; but home, public and traffic injuries and fatalities account for so many off-the-job accidents that business and industry are naturally concerned. Insurance companies, too, will for obvious reasons be interested and helpful.

Even if there is no Safety Council, it may be that an inventory study has been made with the help of the National Safety Council. (Cities of over 5,000 population are eligible for inventory studies.)

One point repeatedly hammered home is that the public doesn't realize ACCIDENTS CAN BE PREVENTED. One child may die of diphtheria and a great hue and cry is raised. Fifty-four may die accidental deaths, and the public shrugs in sad resignation. The Auxiliary is on the right track with its GEMS, SWAT, and Safety Health Parades because the lessons of good safety practices can best be written on the minds of the young.

It is most important that we assist the AMA in its efforts to make the public aware that physicians are vitally interested in ALL community health and welfare problems.

OBITUARIES

William Harold Ryder, M.D.

1894 - 1962

Dr. William Harold Ryder died at his home on December 31, 1962 of amyotrophic lateral sclerosis at the age of 68.

Dr. Ryder was born in New Haven on November 16, 1894, the son of John and Mary Blessington Ryder. He was graduated from Jefferson Medical College of Philadelphia in 1920. After a year of internship at the former Grace Hospital, Dr. Ryder engaged in general practice in New Haven for the next twelve years. From 1932 until 1934 he took his residency in ophthalmology at the Manhattan Eye, Ear and Throat Hospital in New York City. He practiced ophthalmology in New Haven from 1934 until October 20, 1962.

He was a former president of the staff of the Hospital of St. Raphael and chairman of the Executive Committee of that hospital. He was a diplomate of the American Board of Ophthalmology, a Fellow of the American Association of Ophthalmology and Otolaryngology, a Fellow of the American College of Surgeons and the International College of Surgeons. He was a member of the New England Ophthalmological Society and the New York Academy of Medicine. He was a former vice president of the Jefferson Medical College Alumni Association, and a member of the Pan-Pacific Surgical Association. He was a former police surgeon for the City of New Haven and was a member of the Police Anchor Club. Dr. Ryder was president of the Connecticut chapter of the Jefferson Medical College Alumni Association.

Dr. Ryder was a Fourth Degree member of the Knights of Columbus and a member of the Knights of St. Patrick. He was a member of the Yale Faculty Club and the New Haven Country Club where he thoroughly enjoyed golf until he had a coronary occlusion in 1957.

Dr. Ryder was a quiet and unassuming man, completely devoted to his patients and highly skilled in the art of the practice of medicine. He was loyal to Jefferson and he was particularly vigorous in the establishment of the Connecticut chapter of the Jefferson Medical College Alumni Association. He remained active in his practice although very much incapacitated from May until Oct. 20, 1962. It was with great reluctance that he was finally persuaded to give up his practice. We of the medical profession have lost a true friend and devoted physician. He is survived by his wife, the former Claire Daly and three sons, William H. Ryder, Jr., Robert D. Ryder and Charles D. Ryder; and a sister, Miss Ethel M. Ryder.

Robert R. McDonnell, M.D.

Howard Wheaton Brayton, M.D.

1884 - 1963

Dr. Howard Wheaton Brayton, 78, of 6 Long View Road, West Hartford, well-known pediatrician, died Wednesday at Hartford Hospital. He was born in Providence, R. I., on March 4, 1884, a son of Morton and Elizabeth Wheaton Brayton. Dr. Brayton was a graduate of Brown University in 1906 and Harvard Medical School, class of 1910. He interned at Hartford Hospital from 1910-1912 and served as a first lieutenant in the Medical Corps in World War I.

In 1912 he was appointed assistant visiting physician at Hartford Hospital and, a few years later, assisting visiting pediatrician. He later became visiting pediatrician and chairman of the pediatrics department of Hartford Hospital from 1938-1945. He was also consulting pediatrician to several hospitals in central Connecticut and was on the board of directors of Hartley-Salmon Clinic of the Hartford Chapter of the Red Cross. He was at one time physician-in-chief of the Hartford Dispensary.

Dr. Brayton was past president of the Hartford Hospital staff, Hartford Medical Society, Connecticut Pediatrics Society and the New England Pediatrics Society.

He was a member of the Hartford City Medical Society, Hartford County Medical Society, Connecticut State Pediatric Society, the American Academy of Pediatrics, the American Medical Association and a fifty-year member of the Connecticut State Medical Society.

In March, 1952, Dr. Brayton retired from active practice and entered the field of consulting pediatrics. At that time a group of his friends established and subscribed to the Howard W. Brayton Fund at Hartford Hospital, the income of which is used to further the welfare of sick children at Hartford Hospital.

He leaves his wife, Mrs. Mildred Miller Brayton; a son, H. Whiting Brayton of New York City; a daughter, Mrs. Robert B. Krieble of West Hartford; and two grandchildren.

The foregoing is merely the framework of a complete and abundantly fruitful life which Howard Brayton built upon that framework.

Intensely busy in professional activities during his entire active career Dr. Brayton made the time to broaden his horizons by his wide range of reading and by extensive travel at home and abroad. He did not permit a huge and select practice to interfere with the rendering of superlative service to his department of pediatrics, the Hartford Hospital and the entire community.

Dr. Brayton will be held in dear remembrance by colleagues, friends and parents of his patients as a gentleman of wide interests, knowledge and excellent judgement, as a valued, loyal and well loved friend and as a man of brilliant mind and sparkling, never failing wit, which 'seasoned' delightfully his conversation. Truly, his life enriched and brightened the lives of all who knew him. In his life, spent here among us, we have been immeasurably privileged, and for this privilege we are deeply grateful.

HARTWELL THOMPSON, M.D.

In Memoriam

Burns, Francis M.—Shelton; College of Physicians and Surgeons at Columbia University, 1939. Dr. Burns was a practicing physician and surgeon in Shelton for 23 years. He was a member of the staff at the Griffin Hospital. Dr. Burns was a member of the American Medical Association, the Connecticut State Medical Society, and the Fairfield County Medical Association. Dr. Burns died February 15, at the age of 53.

Rowson, Walter, Jr. — North Grosvenordale; Yale University, 1942. During World War II Dr. Rowson was a captain in the Medical Corps, serving in the China, Burma, India Theater of Operations. Dr. Rowson was a member of the Connecticut Society of the American College of Surgeons, the Windham County Medical Society, the Connecticut State Medical Society, and the American Medical Association. Dr. Rowson held membership in Cornerstone Lodge of Masons and he had been a member of the Putnam Lodge of Elks, the Putnam Rotary Club, and the Putnam Lions Club. He had been on the staff of the Day Kimball Hospital since 1946 and an active member of the surgical staff in recent years. In August, 1958 he performed a delicate operation on an 83 year old woman at the Day Kimball Hospital. He replaced a five-inch damaged section of the aorta, with a Y-shaped substitute of crimped dacron. The dacron replaced a weakened portion of the artery's wall and allowed for natural expansion and contraction of the artery. Dr. Rowson died February 19, at the age of 45.

Have You Informed Us of Your Change of Address?

Postal regulations on second class mail have become more stringent. Under a new ruling, we must pay twelve cents per piece for undeliverable second class mail, but worst of all, if you don't happen to reside or practice at the *precise* mailing address which we have for you, your JOURNAL will not be delivered. We urge promptness on the part of all JOURNAL readers in notifying us of address changes!

Special Notices

Third Symposium On Graduate And Postgraduate Medical Education In The Community Hospital

Sponsored by

THE CONNECTICUT HOSIPTAL ASSOCIATION
THE CONNECTICUT STATE MEDICAL SOCIETY
YALE UNIVERSITY SCHOOL OF MEDICINE
to be held at Mary S. Harkness Memorial Auditorium

Wednesday, May 15, 1963
1:30 to 5:30 P.M.

INTRODUCTION

Lifetime Learning for Physicians — Principles, Practices, Proposals

Teaching and Learning in the Community Hospital

New Devices Useful in Medical Education

The Cost of the Hospital Educational Program

Discussion and Question—Answer Period

This Symposium was arranged by the Connecticut State Medical Society's Committee on Postgraduate Education. It has been designed especially for directors of medical education, chiefs of staff, members of hospital educational committees, hospital administrators, and trustees. All interested are invited to attend.

Advance registration is not required. There will be no registration fee.

The entrance to Mary S. Harkness Auditorium is at 333 Cedar Street, New Haven.

Inquiries may be directed to the Office of Postgraduate Medical Education, Yale University School of Medicine, 333 Cedar Street, New Haven 11, Connecticut.

Annual Otolaryngologic Assembly

October 5-11, 1963

The Department of Otolaryngology of the University of Illinois College of Medicine and the Illinois Eye and Ear Infirmary will offer an intensive postgraduate basic and clinical program under the direction of Doctor Emanuel M. Skolnik. This Assembly for practicing otolaryngologists offers a condensed one week program. It is designed to bring to specialists basic information and a wide variety of current advances in medical and surgical management. Basic sciences are reviewed by means of discussions augmented by visual aids.

Panel sessions have been designed to emphasize otologic and reconstructive surgery, tumors of the head and neck, otoneurology, and audiology. Luncheon chats with question and answer periods are an important part of the daily instructional program.

Interested physicians should direct communications to the Department of Otolaryngology, University of Illinois College of Medicine, 1853 West Polk Street, Chicago 12, Illinois.

NEW HAVEN COUNTY MEDICAL ASSOCIATION THIRD ANNUAL CONFERENCE ON PREVENTION AND TREATMENT OF ATHLETIC INJURIES

St. Mary's Hospital—Waterbury
Thursday, April 18th, 1963—1:00-5:30 P.M.

1:00–1:30	Registration
1:30	Introduction to conference Allan J. Ryan, M.D.
1:40	Prevention and Treatment of Heat Exhaustion in Athletes Allan J. Ryan, M.D.
2:00	Pre-season Physical Examination for Athletes Clair B. Crampton, M.D. Wesleyan University, Middletown
2:30	Athletic Injuries of the Knee Vincent J. Turco, M.D. Hartford
3:00	Question period
3:15	Coffee break
3:45	The Role of the Football Coach in the Prevention of Injuries Commander Otto Graham Director of Athletics United States Coast Guard Academy New London
4:15	Athletic Injuries of the Shoulder Malcolm S. Beinfield Westport
4:45	Conditioning and Protective Equipment for the Neck and Shoulders of Football Players Robert Slaughter Head Athletic Trainer Trinity College, Hartford

APRIL — LIVER MONTH

Liver Course

The work-books, bibliography, etc. for the Liver Course already announced were ready early in March *to those who have signed up only*. Please get your check in to Mrs. Intellisano in the office of the Director of Medical Education Norwalk Hospital, Norwalk, Conn.

The *dates* have been *changed slightly* to avoid conflicts with other meetings. The correct dates are:

Tuesday — April 2
Monday — April 8
Tuesday — April 16
Monday — April 22
Tuesday — April 30

All lectures will be 8:00 P.M. to 10:00 P.M. The course has been approved by the Academy of General Practice for Category I credit.

The course is extremely comprehensive, embracing Anatomy, Physiology, new tests and their evaluation, Medical and Surgical Diseases; all under the direction of Yale's Dr. Klatskin's Associates.

HARTFORD HOSPITAL SATURDAY MORNING 11 O'CLOCK GUEST SPEAKERS

April 6 to June 20, 1963

April 6

John W. Hope, M.D., Chief of Radiology, Children's Hospital of Philadelphia.
Subject: "Craniostenosis"

April 13

Closed Circuit T-V
Subject: "The Treatment of Atherosclerosis"

April 19-20

Samuel Asper, M.D., Assoc. Prof. of Medicine, Johns Hopkins.

April 19— 3:00 p.m., Medical Rounds, Newington V. A. Hospital

April 20—11:00 a.m., H. H. Amphitheater
Subject: "Cushing's Disease"

April 26-27

Emergency Room Forum

April 27—11:00 a.m., H. H. Amphitheater
Subject: "The Place of the Emergency Room in Medicine Today"

May 4

Wyland F. Leadbetter, M.D., Chief of Urology, Mass. General Hospital.
Subject: "Renal Vascular Hypertension" (The Thomas N. Hepburn Memorial Lecture)

May 10-11

Tihamer Csaky, M.D., Prof. of Pharmacology, Univ. of Kentucky.

May 10—Grand Rounds, Pediatric Service

May 11—11:00 a.m. H.H. Amphitheater
Subject: "Drug Effects in Pediatrics"

May 18

Leon Chesley, M.D., Downstate Medical Center, New York
Subjects: 10:00 a.m. "Renal Effects of Angiotensin in Nonpregnant and Pregnant Women"
11:00 a.m. "Relationship Between Toxemia of Pregnancy and Hypertensive Disease"

May 23-25

J. Englebert Dunphy, M.D., Prof. of Surgery, Univ. of Oregon.

May 23—Newington V.A. Hospital

May 24—House Staff Rounds and Conferences

May 25—H.H. Amphitheater
9:00 a.m. "Surgical Clinic"
11:00 a.m. "Surgical Vagovies of the Colon"

May 25—10:00 a.m. Grand Rounds

June 1

Research Forum—11:00 a.m.—H.H. Amphitheater

June 7-8

Max Miller, M.D., Assoc. Prof. of Medicine, Western Reserve.

June 7— 3:00 p.m. "Degenerative Vascular Lesions in Diabetes Mellitus" (Newington V.A. Hospital)

June 8—11:00 a.m. H.H. Amphitheater
Subject: "Use and Abuse of Oral Antidiabetic Agents"

June 20

Hartford Hospital House Staff Graduation and Alumni Reunion.

1963 MEETINGS

April 30-May 1-2—171st Annual Meeting, Connecticut State Medical Society, Statler-Hilton Hotel, Hartford.

May 15—Third Symposium on Graduate and Postgraduate Medical Education in the Community Hospitals to be held at the Yale-New Haven Medical Center, 1:30-5:30 P.M. Sponsored by the Connecticut State Medical Society, Connecticut Hospital Association and Yale School of Medicine.

June 16-20 — American Medical Association, Annual Meeting to be held in Atlantic City.

September 27—38th Connecticut Clinical Congress to be held at the Yale-New Haven Medical Center.

December 4—Annual Meeting of the Connecticut Society of American Board of Surgeons, Inc.

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FOR SALE: To settle estate. Complete Picker X-ray unit, equipment and accessories. Contact Attorney Robert Kapusta, 88 Main Street, Ansonia.

Doctor's Office

John Burbank, M.D., Michael J. Esposito, M.D. and John F. Hennessey, M.D., announces the removal of their office from 236 West Main Street to 335 Cook Avenue, Meriden.

Harvey W. Kaetz, M.D., announces the removal of his office from 256 Bradley Street to 111 Park Street, New Haven.

George T. Kiss, M.D., announces the removal of his office from 144 Golden Hill Street, Bridgeport, to consolidate with his Fairfield office at 1240 Post Road, Fairfield.

Edward P. Kuczko, M.D., announces the removal of his office from 28 Church Hill Road to 12 Main Street, Newtown.

Joseph J. Lucas, M.D., announces the opening of an office for the practice of internal medicine at 81 South Main Street, West Hartford.

Walter S. Morgan, M.D., announces the removal of his office from 1876 Whitney Avenue to 111 Park Street, New Haven.

Abbott A. Newman, M.D., announces the removal of his office from 144 Golden Hill Street to 2660 Main Street, Bridgeport.

Joseph M. Simonelli, M.D., announces the opening an office for the practice of internal medicine at 345 Main Street, Danbury.

John A. Tighe, M.D., announces the opening of an office in association with A. G. Ansprenger, M.D., for the practice of radiology at 35 Huntington Street, New London.

Morris A. Wessel, M.D. and Robert G. LaCamera, M.D., announces the removal of their office from 1187 Chapel Street to 878 Howard Avenue, New Haven.

Robert J. Williamson, M.D., announces the removal of his office from 105 Woodland Street to 104 Stearns Street, Bristol.

Isidore Yasser, M.D., announces the removal of his office from 144 Golden Hill Street to 2660 Main Street, Bridgeport.

Deaths From Mycetism

The National Registry of Deaths from Mycetism maintains a file of deaths attributed to ingestion of wild mushrooms (1957 to date).

Physicians are requested to send notice of all such deaths (age, sex, date, locality to Robert W. Buck, M.D., Secretary, Massachusetts Medical Society, 22 The Fenway, Boston 15, Mass.

Around The State

New Haven County

Dr. Allan J. Ryan of Meriden has been reappointed a member of the Committee on Medical Aspects of Sports of the American Medical Association. Dr. Ryan's reappointment was announced by Dr. Percy E. Hopkins, chairman of the A.M.A.'s Board of Trustees in Chicago.

Cancer Society Gives New Books

Two new books, dealing with techniques of cancer detection and care of the cancer patient, have been placed on the shelves of the state's medical libraries by the Connecticut Division, American Cancer Society.

They are: "Early Detection and Diagnosis of Cancer," by O'Donnell, Day and Venet, and "The Physician and the Total Care of the Cancer Patient," a record of the proceedings of the 1961 American Cancer Society Scientific Session.

The volumes were donated by the state Cancer Society, as a part of its Branches' Professional Education Program, and have been distributed to libraries in Connecticut's hospitals. This year-round, statewide effort is carried on to help bring the latest developments in cancer diagnosis and treatment to the state's physicians.

The Cancer Society reports that the books have been received with enthusiasm by the libraries, and urges wide use of them by physicians for reference purposes.

Bridgeport Heart Association

The Greater Bridgeport Heart Association will sponsor its annual Physicians' Meeting on Wednesday, April 17, 1963, in the auditorium of Bridgeport Hospital, it has been announced by Murray A. Rosenberg, M.D., chairman of the association's professional education committee.

Alvan R. Feinstein, M.D., assistant professor of medicine at Yale University School of Medicine, and chief of clinical pharmacology at the V.A., will discuss "Prevention of Rheumatic Fever."

David Scherf, M.D. will speak on "Paroxysmal Tachycardia." Dr. Scherf is professor of clinical medicine and chief of the cardiovascular section at the New York Medical College.

Louis A. Soloff, M.D., professor of clinical medicine, and chief, division of cardiology at Temple University Medical Center, will have as his topic, "Recent Advances in Diagnosis and Treatment of Coronary Artery Disease."

It is expected that there will be A.A.G.P. accreditation for the program.

NEW BOOKS IN REVIEW

SILENT SPRING by Rachel Carson, illustrated by Lois and Louis Darling. Houghton, Mifflin Co., Boston, Mass., 368 pp. $5.00.

REVIEWED BY ROY N. BARNETT

This is an important book whose impact on human life, thought and survival will be far greater than that of the purely medical books usually reviewed in these columns. It was serialized in part in the New Yorker Magazine, so that even before its book publication and choice as a Book of the Month Club selection it was familiar to many influential Americans. It was publicly mentioned by President Kennedy and Congressman Sibal of Connecticut and will doubtless be discussed in Congressional deliberations when Agriculture Department appropriations are debated.

The subject matter is the progressive pollution of our world and disturbance of the balance of Nature by chemical insecticides and weed-killers. The author is already one of the best known biologists in the United States by virtue of her earlier best-sellers, "The Sea Around Us" and "The Edge of the Sea." Her style is lucid, colorful and even beautiful. The illustrations, by two Connecticut biologists, are charming as well as accurate; they have a certain Japanese print quality.

The chemical substances which Miss Carson feels threaten to inundate life on earth include the three great groups of insecticides; arsenic, the chlorinated hydrocarbons such as DDT and chlordane, and the organic phosphorus compounds such as malathion and parathion; and the herbicides which include arsenites and the "mutagens" 2-4 D and their ilk. Many of these have the unpleasant quality of being both durable and soluble. When spread on plants they ultimately fall to the ground, flow off with the rains into streams and rivers, and pollute surface water, deep wells, lakes, and oceans in cumulative fashion. They are serially concentrated in living creatures, so that 1/50 part per million of DDD in lake water resulted in one instance in a concentration of 5 ppm. in the plankton and as high as 2500 ppm in some of the fishes.

Although applied with the intention of killing specific insect pests or weeds, their action is not that precise; they also kill beneficial insects, soil organisms, birds, fish, animals and desirable plants. In this way they upset the delicate balance of Nature in most haphazard and potentially dangerous fashion. Enormous total quantities are used, often to achieve such small ends as control of minor insect nuisances, or to further increase overproduction of agricultural products. The goals reached are often temporary, so that some pests have been "totally exterminated" repeatedly, or are lost because other equally destructive pests appear to replace those temporarily diminished. An example of futile spraying is the chemical treatment of the American elm, a program familiar to most Connecticut residents. There is little evidence that it helps the elms, whose only salvation lies in careful pruning and destruction of dead wood. There is abundant evidence that the insecticides, falling to the ground when the leaves drop, are concentrated in earth-warms which then kill the birds which eat them, thereby disposing of one of the elm tree's main protectors Another serious problem is the development of resistance by the target insects, possible because of the short interval between insect generations and their rapid multiplication. For example in 1944 in Naples the body louse was so susceptible to DDT that the whole human population was readily deloused in a single massive campaign. By 1950-51 in Korea body lice not only survived 5 per cent DDT powder but grew more numerous when it was applied!

Some of the more controversial material in the book is directly concerned with the direct effects on man. Some of these effects are incontrovertible, as the parathion morbidity of over 200 cases per year in California, and the average of over 336 deaths per year from parathion in Japan. Chemical carcinogens derived from industrial processes are already well recognized; examples are soot, arsenic, redium and aniline dyes. Are the chemical insecticides, now present in the tissues of almost all Americans, also carcinogens, either directly or by synergistic action? Miss Carson's few case reports are not convincing. However the opinion of her chief medical authority, Dr. W. C. Hueper of the National Cancer Institute that there is a real possibility that these materials are human carcinogens, is both authoritative and disquieting. In addition to being carcinogens, many of these substances produce sterility or gene mutations in insects and birds; we have no assurance that humans are less susceptible to such effects, some of which may not be perceptible for many years.

What alternatives do we have to the use of potent chemical killers? Shall we let the insects take over the world? Miss Carson believes that there are many more specific, far less dangerous control measures, requiring only ingenuity and study for development. She quotes many heartening examples of biologic control methods effectively directed at a single target. For example the extensive liberation of screw worm flies sterilized by irradiation was effective in wiping out the destructive screw-worms of Curacao; they mated with healthy flies but produced sterile eggs. Another technique depends on "attractants." Using odors of the opposite sex or of food, or alluring sounds, great numbers of insects can be lured to their death. A very specific method is the use of biotic diseases such as milky spore disease of Japanese beetles; these infect only certain species, and in some instances have a permanent effect. Finally the natural enemies, such as ladybugs, spiders, ants, birds or mammals can be introduced or propagated.

The widespread development and use of the chemical poisons is encouraged by the manufacturers and by the U. S. Department of Agriculture. Protection against them is pitifully inadequate. Although tolerances for chemical residues in foods have been established, there are so few inspectors that less than 1 per cent of our food is examined. This provides little assurance that our food is free from massive contamination due to careless or unskilled application of insecticides.

It is the informed public which can demand a new approach to this problem, including use of less durable synthetic chemicals, smaller doses of sprays, development of biologic control techniques, and more extensive inspection of food. This volume should go far toward creating an informed public.

EXPOSURE TO RADIATION IN AN EMERGENCY. Authors: National Committee on Radiation Protection and Measurements, Report No. 29. Publishers: The University of Chicago, 1962. Price: $0.50 each. 95 pages, three appendices, three graphs, fifteen tables, table of contents takes the place of an index. Special Information: This report is available only from the Section of Nuclear Medicine, Department of Pharmacology, the University of Chicago, Chicago 37, Illinois.

REVIEWED BY MARSHALL BRUCER

The handbooks of the National Bureau of Standards (Superintendent of Documents, Washington 25, D.C.) have been enormously successful, particularly in the field of radiation. Most are the best possible opinions of a committee of experts. The problem of *Exposure to Radiation in an Emergency* is more medical than physical; but it is so highly interrelated that the Rockefeller Foundation supported a report similar to the handbooks to be prepared by the Section of Nuclear Medicine of the Department of Pharmacology at the University of Chicago.

The committee states its limitations to the effects of total-body irradiation from external sources. They outline the "worse possible disasters" from thermonuclear weapons and major accidents, the populations that might be involved, and the administrative and medical categories of injury. The nature, origin, and disposition of "fallout," "washout," and "rainout" are described. Methods of estimating radiation dose are given.

The clinical features of radiation exposure are divided into an asymptomatic group at less than 50 r exposure and a number of acute radiation sickness groups ranging from mild sickness (statistically) at less than 200 r exposure to almost certain death when the exposure is in excess of several thousand r. The term "chronic radiation sickness" does not recognize but implies both chronic radiation and chronic sickness; it is passed off with ". . . almost no information." Special problems of epilation and chronic dermatosis are described. Internal radiation injury is dismissed with ". . . limited human experience." Genetic effects of radiation are described as "detected only by statistical studies." Sterility, leukemia, cataract, cancer, shortening of life span, and fetal irradiation are put into their proper perspective. A relatively new concept of equivalent residual dose (ERD) leads to a discussion of the problem of protracted exposure. The prognostication of effects, admittedly inaccurate, is outlined.

The problem of infection is passed off with ". . . no clinical data." This is not true. There are some clinical data; however, the committee is probably correct in considering it insufficient. The very important, and not wholly subsidiary, effects of large radiation exposures on livestock and agriculture are considered.

Three technical appendices describe the definitions of quantities and units, the method of calculating an equivalent residual dose, and some empirical relationships between contamination and skin dose.

For the physician who is too busy to follow the babble of scientific controversy on radiation injury, this booklet is an excellent summary of what can be believed to date. For the physician who is advising on civil defense, the booklet is essential. For the teacher who wants to know how to present a thoroughly confusing and controversial subject matter, this is a good example to follow.

ANATOMY REVIEW, 1200 Multiple Choice Questions And Answers Completely Referenced. By Marvin I. Gottlieb, M.D., Medical Examination Publishing Co., Inc., New York 1961 180 pp. $4.00.

BIOCHEMISTRY REVIEW, 1200 Multiple Choice Questions And Answers Completely Referenced. By Erwin H. Mosbach, Ph.D., Medical Examination Publishing Co., Inc., New York 1961 137 pp. $4.00.

REVIEWED BY LOUIS H. NAHUM

These two books are of inestimable help to students preparing for examinations at the end of their course and for Part One National Boards.

At the end of the books are an answer key by which the student can see how closely he has succeeded in the multiple choice answers. It is always possible for differences of opinion in multiple choice questions between the answers offered by the author and those the student has learned from his teacher or his textbook. When in doubt, it is important that the student refers back to his textbook three of which are listed. Biochemistry A. White et al., J. S. Fruton, et al., and E. Baldwin. In anatomy the textbooks by Grant, Gray and Shaeffer. In Histology, Maximow and Bloom, Neuroanatomy, Ranson and Clark and Developmental Anatomy by Arey.

In retrospect this reviewer who has all the examinations he is going to take behind him was challenged by these multiple choice questions and it became quite a game to find the correct answers. I recommend to all physicians and surgeons to turn to these questions every time they take up a cross-words puzzle. These questions are more stimulating, more searching of our own knowledge, gives a glimpse of how far basic science has travelled in the last few years and where we need to brush up. Everyone is worried about how the general physician can be induced to engage in continuous education to keep abreast of medical science. It is the basic science that is growing. In these books one can find one way of keeping up.

VIROLOGY AND EPIDEMIOLOGY. CONTRIBUTIONS IN HONOR OF JOHN RODMAN PAUL. Edited by Dorothy M. Horstmann, M.D. Archon Books, Hamden, Conn. 1961-62. 285 pp. $8.50.

REVIEWED BY PAUL B. BEESON

One of Yale's most distinguished scientists has been honored by the publication of a *festschrift.* The occasion was Dr. John R. Paul's retirement in 1961 as Professor of Preventive Medicine at Yale. The 18 articles, by friends and former associates, first appeared as a special number of the Yale Journal of Bilology and Medicine, and are now available in hard covers, from the Archon Press. The subjects of the contributions tend to reflect the areas in which Dr. Paul has conducted investigations, such as infectious mononucleosis, viral hepatitis, rheumatic fever, poliomyelitis, and other enterovirus infections. Among the contributors are two Nobel Prize winners, Enders of Boston and Burnet of Melbourne, Australia. They write about measles vaccination and cellular aspects of immunity. Other contributions from abroad include

Christopher Andrews and Jeremy Morris of England (common cold viruses and coronary disease), Sven Gard of Sweden (poliomyelitis), and James Gear of South Africa (Coxsackie virus infections). The scientific stature of the contributors testifies to the importance of this collection of essays, but beyond that one senses that each author had labored especially hard to present an outstanding contribution as testimony of his affection and admiration for Dr. Paul.

A PRIMER OF WATER, ELECTROLYTE AND ACID-BASE SYNDROMES, Goldberger, E., 2nd ed., Lea and Febiger, Philadelphia 1962, pp. 374.

REVIEWED BY: ROY N. BARNETT

Dr. Goldberger, author of several other medical monographs, has a smooth, authoritative style and a considerable gift for organizing material so that it can be easily found for study. This small volume contains a vast amount of information. It is organized into 5 parts entitled "The extra cellular water; Syndromes associated with water disturbances; Syndromes associated with sodium disturbances; Syndromes due to disturbance in acid-base balance and The principles of fluid therapy." At the end are 4 brief appendices giving specific methods of calculating fluid shifts, osmolar equilibria, and the effect of hyperglycemia on sodium concentration.

There are, unfortunately, certain major weaknesses in his approach which make this volume unsatisfactory.

To begin with, the formulas for calculating replacement therapy are, in the case of metabolic acidosis and alkalosis, based on extracellular fluid only (20 per cent of body weight) rather than the more nearly correct 50 per cent of body weight which takes into account the buffering of acid loads by cellular contents. This is only part of his reluctance to correct deficits adequately; he recommends attempting to raise CO_2 to only 18 mEq, chloride to 90 mEq, and in the case of sodium he says "not more than one-half this (the calculated) amount should be given." (p. 102) If the patient needs the treatment, and the correct dose can be calculated, why give one-quarter or one-half? Unfortunately this reflects a common error in treating water and electrolyte disturbances. It leads Dr. Goldberger to recommend the treatment of severe acute sodium loss with isotonic saline (p. 102), a method unlikely to succeed. It also leads him to recommend replacement of losses due to gastric suction by half-isotonic saline, whereas loss is often of isotonic material. Nor does he refer to aggravation of azotemia in chronic renal failure by sodium deprivation, an all too common phenomenon.

His analyses of acid-base disturbances based on the calculation of CO_2 content seems to have no real advantage over use of the pCO_2 calculated from the same determinations. The use of 2 parameters whose interpretation is much the same can easily confuse the reader without adding any new information.

The reference to accumulation of fluid in the cirrhotic liver (p. 124) is somewhat puzzling; the cirrhotic liver is often fatty, often fibrotic, sometimes small, but rarely wet.

In the discussion of hypopotassemia little attention is given to urine analysis for potassium; this often provides a clue as to the primary renal or extrarenal loss of this cation. There is only a mention of the use of sodium lactate in treatment of hyperpotassemia; frequently this is the most valuable emergency measure. In discussing parenteral therapy in surgical patients the author says "if more than 300 ml of

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blood has been lost as a result of the operation the blood should be replaced." (p. 137) This recommendation could lead to many unnecessary transfusions with the usual hazards of hepatitis and untoward reaction. The blood donor gives up 500 ml. of blood and continues in an upright position about his daily tasks; the postoperative patient lying in bed can easily spare considerably more.

The suggested methods for determining sodium and chloride in the urine might be of use in primitive areas; in in most hospitals in the United States more precise methods are readily available.

Although there is a fairly extensive discussion of CO_2 methods, nowhere does the author indicate the standard deviation of methods used to determine all of the blood constituents discussed, a useful point in evaluating small variations from day to day.

Some of the mistatements are the following. "The stimulus for the secretion of aldosterone is probably the efficiency of the heart as a pump and the volume of blood in the had—" (p. 43). Actually the kidneys, probably the juxtaglomerular apparatus provide the stimulus for aldosterone secretion. "In water loss due to solute excess the patient gains weight—" (p. 68). This is nonsense — the diabetic in ketosis is quite dry and shrivelled up! "Sodium loss through the kidneys—can occur in the following ways—such as the nephrotic syndrome—" Patients with nephrotic edema generally excrete too little sodium, not too much. "Hyponatremia with true sodium loss may also occur in marked hyperglycemia, hyperlipemia or *hypercholesterolemia* —" (p. 95). Hypercholesterolmia produces neither the osmotic effect of glucose nor the water-replacing effect of fat, and is not accompanied by hyponatremia.

The discussion of "internal dilution hyponatremia" (p.107) is based upon the erroneous assumption that cellular losses of K trigger the secretion of ADH. Were this true every patient with hypokalemia would tend to develop the syndrome; such is not true. The incorrect idea that decrease in cellular extrusion of Na due to metabolic deficiencies causes hyponatremia is expounded on pages 23 and 24. Inasmuch as water passes across cell membranes with the sodium a rise in intracellular Na produces swelling of the cell, not lowering of extracellular Na.

In a particularly blatant error he recommends resuspending packed red blood cells in 5 percent dextrose in water (p. 345). Apparently he has not read his own previous sentence warning of the danger of hemolysis when blood and 5 per cent dextrose are mixed

It is unfortunate that Dr. Goldberger's familiarity with the subject is not on a par with his ability to organize and write. The book is not recommended.

Management Of The Rheumatic Patient

By Hans Waine

Arthritis and Rheumatism VI: 83 — 1963

This short article of five pages with an additional five pages of discussion is of great value for the physician who has a feeling of helplessness when confronted with an arthritic patient. The soundness of Dr. Waine's approach is the deemphasis on remedies, or cures, and the emphasis on the handling of a patient such as would be expected of the skillful internist. This approach is not new; it is the approach by which the late Dr. Joel Goldthwait, an orthopaedist, so successfully used over a quarter of a century ago when there was little research money available and a collosal ignorance of the subject in the profession as a whole. In the interest of better handling of patients with this condition even today, wide dissemination of Dr. Waine's presentation is greatly desired.

Denis S. O'Connor, M.D.

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David Marshall, Age 34—M.D. Columbia P. & S. 1955. Specialty Obs-Gyn. Available July 1963.

David Kovacs, Age 34—M.D. Medical University of Budapest, Hungary 1954. Specialty Obs-Gyn. Available July 1963.

Jay C. Pass, Age 33—M.D. Medical School Chicago 1957. Specialty Obs-Gyn. Available July 1963.

Timoleon D. Deliyannis, Age 40—M.D. National University of Athens School of Medicine 1947. Specialty Surgery.

Raymond Dupuy, Age 40—M.D. University of Haiti 1950. Specialty Radiology.

Eugene J. Goldman, Age 31—M.D. Northwestern University 1957. Specialty Urology.

Obstetrician-Gynecologist, Age 34—M.D. Jefferson 1955, Family, Catholic.

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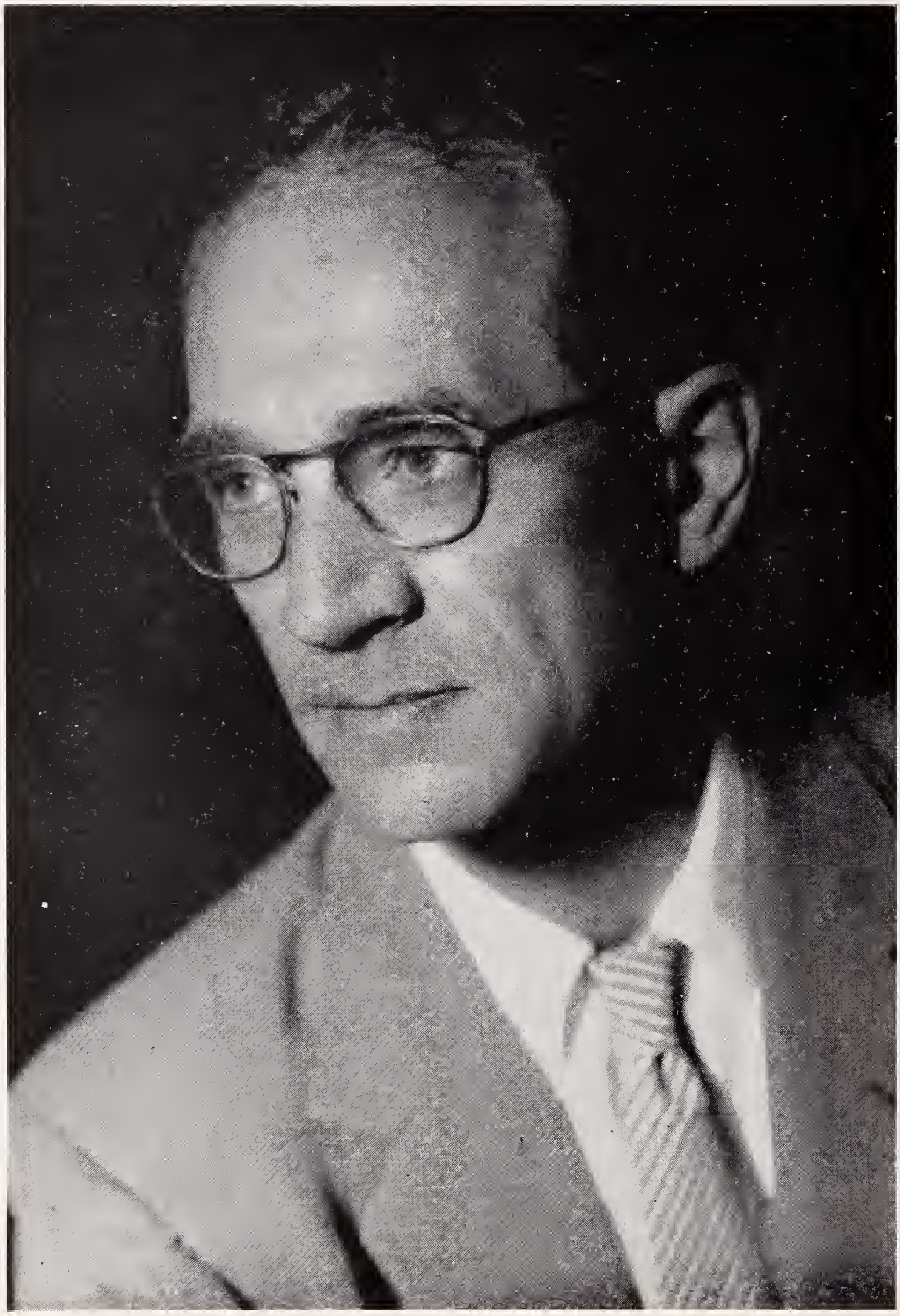

Morris P. Pitock, m.d.

THE PRESIDENT'S PAGE

If you saw the televised "White Paper on Nationalized Medicine in Britain," by Chet Huntley on March 31, 1963, you must have been impressed as I was by the overwhelming approval expressed by the participants. For the most part Mr. Huntley permitted the participants to speak for themselves, and pictured the life and activities of the average physician in his "surgery" pretty much as we had expected it to be.

On the whole, it was a very fair appraisal of the British system of socialized medicine, even to the qualified approval of both physicians and patients. But my own over all impression was of a permeating bleakness which was rather depressing, and I wonder how many of our viewing public got the same impression.

It seems to me that any system which provides medical care on a broad basis is an improvement over that which prevailed in Britain before socialized medicine was legislated. Living on an economic scale much below that to which Americans are accustomed, it should come as no surprise that in the pre-nationalized days, the average Briton tolerated his minor ailments with stoical fortitude and a visit to the neighborhood pub, and spent few of his shillings and pence for medical attention. Things are different now. He can visit a doctor at no direct cost to himself, have medicine prescribed at a shilling per prescription, all paid for by taxation. The manner in which the harried doctor attends him is a vast improvement over no attention at all.

The attitude of the physicians is a little harder to understand. To say, as one physician did, that he devotes two minutes on the average in treating a patient in his "surgery," comes as something of a shock. Indeed, the five minutes he devotes to a patient who requires examination, is startling, until the viewer sees the nature of the examination. A young person, standing before the seated doctor, is poked in the Rt. L. Q., and asked if it is painful. That was all there was to the examination.

As for hospitalization—this is an even more depressing prospect. When the general practitioner requires consultation, the patient is sent to a hospital where he can be diagnosed in a clinic, or admitted to the hospital for treatment. Here he has no choice of consultant, and should surgery be required, no choice of surgeon, if indeed, he can be admitted at all without a prolonged delay.

The televised picture of patients waiting in the hospital outpatient clinic is that with which we are all familiar in our own free clinics. In essence, this is free clinic medicine, at a tax burden which is now three times the predicted cost. And at what a cost! The once proud and world renowned British medical profession now gives the acquiescence of the cowed and cringing to a nationalized program that was imposed on them only over their strenuous objections. No wonder thousands of them emigrate yearly to Australia, New Zealand, Canada or the United States.

Americans are now being tantalized with prospects of "free" medical care as proposed by the present administration. Such a step is not only irrevocable but far more expensive than predicted. The deadening influence of political control is not only all-pervading, but destructive of the eminence which British Medicine attained under free enterprise.

Today American medicine is the best in the world. It has grown to its present stature because our citizenry are demanding of the best that our profession can provide. To promise that a system of socialized medicine will provide the same high standard as "free medical care" is to delude our people. I urge our citizens to take a long, hard look at all such schemes, before they take the bait.

Morris P. Pitock, m.d.

Carotid Sinus Asystole

Report Of A Case

FREDERICK W. HEHRE, M.D.
RICHARD M. SENFIELD, M.D.
STANLEY BRODOFF, M.D.
New Haven

Carotid sinus asystole has been an accepted medical entity since its original description in 1933 by Weiss and Baker.[1] However, a few accounts exist in the literature of outright cardiac arrest, especially occurring during anesthesia.

Case Report: J.E.H. Unit No. 583668

A 64-year-old white male was admitted to the Grace-New Haven Community Hospital on October 17, 1962 with a chief complaint of a mass in the left parotid region. Present illness: The mass had been noted 8 to 12 months prior to admission and was entirely asymptomatic, but had enlarged slowly to its present size. Past health and illnesses: The patient had been shot through the right lung in 1919. The bullet was uneventfully removed from the body of the twelfth thoracic vertebra in 1937. He had suffered a myocardial infarction approximately 10 to 12 years ago, and had subsequently developed angina pectoris which was relieved by nitroglycerin. He occasionally had dyspnea associated with the angina. He had also noted dizziness when leaning over. Physical examination: There was a six-centimeter mass at the angle of the left mandible. It was soft, movable, and non-tender. There were no associated skin changes over the mass and there was no palpable cervical lymphadenopathy. Part of the mass lay medial to the ramus of the mandible. Blood pressure was 110/70 mm. Hg. Cardiac rhythm was regular sinus. The heart sounds were of good quality, and no murmurs or rubs were heard. The chest was increased in the anteroposterior diameter. The lungs exhibited distant breath sounds, with fine rales. He had a healing stasis ulcer on his right calf. The remainder of the physical examination was essentially negative. Laboratory data: hematocrit 48 per cent; white blood count 6,750 per cu. mm.; urinalysis normal; VDRL nonreactive. Electrocardiogram showed a probable old posteroinferior myocardial infarction. Admitting diagnoses: 1) Mixed tumor of the left parotid gland. 2) Arteriosclerotic heart disease, with old myocardial infarction and angina pectoris. 3) Pulmonary emphysema.

On October 18, 1962, he was brought to the operating room after preanesthetic medication with secobarbital 0.100 gm., morphine 0.008 gm., scopolamine 0.0004 gm., at 10:30 a.m., the effect of which was described as good. Anesthesia was induced at 12:15 p.m. with thiopental 0.325 gm. He was given succinylcholine 0.060 gm. The larynx and trachea were sprayed with tetracaine 1 per cent and a #42 French Magill endotracheal tube was inserted. Anesthesia was continued with cyclopropane and nitrous oxide in a semi-closed carbon dioxide absorption system. Following induction of anesthesia, he suffered several short periods of hypotension with a systolic blood pressure of 80 mm. Hg. This was treated with three separate intravenous injections of ephedrine, 0.0125 gm. When the operation began, his blood pressure was in the systolic blood pressure range of 130 to 140 mm. Hg. Forty minutes after the onset of surgery, his blood pressure dropped from 130 mm. Hg to 80 mm. Hg systolic blood pressure. At the same time, his pulse rate fell from 84 to 72 beats per minute. This hypotension was not treated and the blood pressure rose slowly over the next 15 minutes to the 130 mm. Hg systolic blood pressure range. At 2:30 p.m., one hour and 45 minutes after the beginning of operation, his pulse and blood pressure were suddenly unobtainable. This was confirmed by several observers. The surgeon immediately began closed chest cardiac massage. Controlled positive pressure respiration with 100 per cent oxygen was started and he was given ephedrine, 0.050 gm., intravenously. The duration of arrest was estimated to be less than one minute. His next observed blood pressure was 100 mm. Hg systolic, and this gradually rose over the

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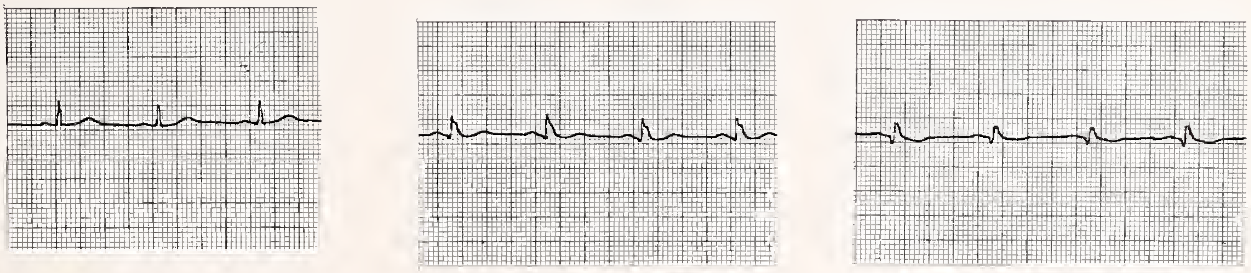
next 20 minutes to 170 mm. Hg systolic. In retrospect, at the time of asystole, the surgical retractors were placed medial to the ramus of the mandible to aid in the exposure of the retromandibular dissection of the tumor. A cardio-oscilloscope was connected and his electrocardiogram was observed to be essentially the same as his preanesthetic tracing. However, there were slight differences in the S-T segment, and it was decided to terminate the operation. During the closure of the wound, the patient's blood pressure remained in the range of 120 mm. Hg. His course in the recovery room was without incident. Electrocardiogram taken in the recovery room showed, in addition to the old changes noted, RST depression in lead V4, suggestive of mild myocardial hypoxia. Later that evening, he was alert and talking. His vital signs were stable, and cardiac rhythm was regular, but he exhibited left facial nerve paralysis, thought to be due to operative trauma. Electrocardiogram taken on the following day revealed a pattern compatible with improved status. Again the changes in leads II, III, and VF were suggestive of old posterior myocardial infarction. Tracings taken four days post-operatively, revealed essentially no change. He was apparently in normal status and his facial nerve function was returning. On October 23, 1962, five days after the original procedure, he was again brought to the operating room after premedication with pentobarbital 0.150 gm. and scopolamine 0.0004 gm. at 6:30 a.m., the effect of which was described as good. He was given translaryngeal injection of tetracaine, 0.020 gm., and anesthesia was induced at 8:10 a.m. with thiopental 0.300 gm. A #40 French wire spiral endotracheal tube was inserted after injection of succinylcholine 0.040 gm. Anesthesia was continued with halothane in a semi-closed circle absorption system. The entire anesthetic and operative courses were smooth. The dissection was complete in two hours and 25 minutes, and he was brought to the recovery room in good condition. The immediate post-operative recovery period was uneventful. Electrocardiogram taken in the recovery room showed bizarre abnormalities of the descending limb of the QRS complex in leads I, II, III, VF, V5, and V6 suggestive of "altered myocardial metabolic activity of a non-specific nature." Serial electrocardiograms were advised. On the following day he had an episode of angina pectoris which was relieved by nitroglycerin. Electrocardiogram taken later that day showed that the tracing had reverted to normal appearance, except for some notching of the QRS complex in V6, but, that the pattern was compatible with improved myocardial status in the presence of a probable old posterior infarction.

He was out of bed without complaints on the third post-operative day, but exhibited some signs of facial weakness. He was discharged on the seventh post-operative day. Pathological report on the surgical specimen was papillary cystadenoma lymphomatosum (Warthin's tumor).

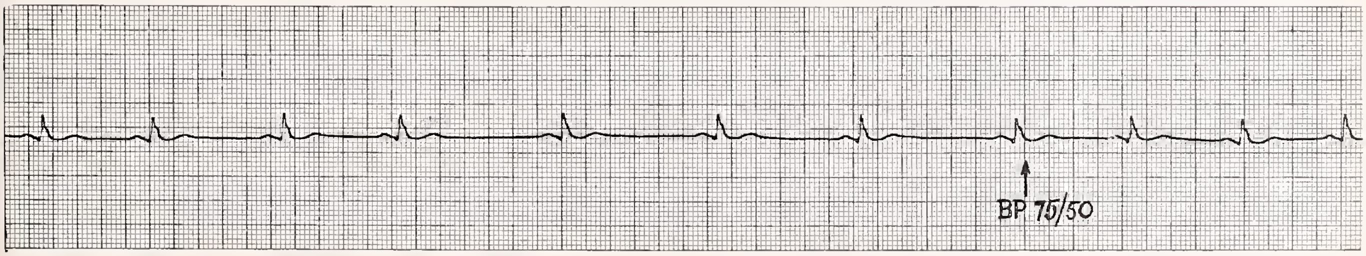
When seen again, 21 days after discharge, his recovery had continued to be excellent. There was no evidence of cardiovascular or neurological damage other than the left facial nerve paralysis which persisted. His electrocardiogram was unchanged from that at the time of discharge. With the patient in the supine position stimulation of the carotid sinus was carried out with digital pressure. The significant portions are shown in Figure I. Hypotension from 90/50 mm. Hg to 75/50 mm. Hg occurred simultaneously with the slowing in rate. Stimulation was discontinued as soon as change appeared and the patient experienced no untoward effects.

JEH 19-11-62

FIG. I



LEAD I LEAD II LEAD III



EKG LEAD II WITH CAROTID COMPRESSION

Discussion

Most communications on the carotid sinus syndrome have described three types. The first and most common is cardiac asystole of vagal origin associated with hypotension, bradycardia and cerebral hypoxia, potentiated by digitalis and parasympathomimetic drugs, and abolished by atropine. Second in frequency is hypotension occurring without changes in heart rate, counteracted by ephedrine or epinephrine. Third is the cerebral type characterized by loss of consciousness with normal pulse and blood pressure, and unaffected by atropine or epinephrine.[1,2,3] This is not well documented, however, and can be attributed to decreased cerebral blood flow due to carotid compression alone, since the same response can be elicited by pressure elsewhere along the course of the artery. Recently Selvin and Howland[4] have described five different manifestations of carotid sinus reflexes: 1) bradycardia alone, 2) hypotension alone, 3) hypotension and bradycardia, 4) hypotension and tachycardia, 5) hypotension, bradycardia, and apnea. Carotid sinus reflexes occur most frequently in males over the age of 50 with documented arteriosclerotic cardiovascular disease.

Weiss, *et al.*[5] have stated that carotid sinus syndrome is frequently associated with angina pectoris. The patient presented exhibited all the classical signs for suspecting carotid sinus syndrome, and in addition exhibited dizziness on leaning over.

Carotid sinus syndrome has classically been treated by the injection of atropine which Selvin and Howland felt reversed the hypotension as well as the bradycardia. Infiltration of a local anesthetic into the sinus area and the removal of surgical stimuli will also help to alleviate the syndrome. Since this patient's hematocrit was 48 per cent, we doubt that he exhibited the profound hypotension without asystole thought by Selvin and Howland to be the effect of hypovolemia.

Summary

A patient is presented who exhibits the common criteria of carotid sinus syndrome, namely, a male over 50 years of age with evidence of arteriosclerotic heart disease manifested by posteroinferior myocardial infarction and angina pectoris. He suffered an episode of carotid sinus hypotension and bradycardia, followed by a second episode of carotid sinus asystole during the removal of a parotid tumor while a surgical retractor was in place in the retromandibular space. He responded immediately to closed chest cardiac massage and ephedrine. The operation was cancelled but the patient was subsequently reoperated upon successfully.

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> A very large percentage of the scientific material read by scientists is outside their own fields and we do not know enough about the processes of research creativity to determine the relative importance of purposeful reading and chance reading. We do not know much about the process of creativity that is triggered in the trained mind by what, to others appears to be non-pertinent reading.
>
> —Professor Ralph Shaw, *Documentation and the Individual.*

The Influence Of Protein Patterns And Pregnancy On The T3 Test

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The advantages of the test employing the red blood cell uptake of I 131-triiodothyronine, the so-called T3 or T3/rbc test, are well known. The purpose of this report is to discuss some aspects of a problem involving the principle behind this determination.

It is common knowledge that, utilizing paper electrophoresis with veronal buffer at pH 8.6, a plasma globulin situated between $alpha_1$ and $alpha_2$ globulin carries the vast majority of circulating thyroid hormone and this is called the thyroxine-binding protein or globulin. This TBP becomes relatively saturated at increasing concentrations of thyroxin.[3] As the level of stable thyroxin rises above 0.2 ug/ml of serum (the approximate normal thyroxine binding capacity of TBP), more and more of added labeled T4 or T3 attaches to secondary binding sites, be they albumen, erythrocytes or amberlite resin. The amount of secondary binding is directly proportional to the relative saturation of TBP and is the basis of the T3/rbc test as a measure of thyroid activity.

This leads to a discussion of the difficulty one encounters occasionally in this principle underlying the test. If one is indeed measuring indirectly the level of saturation of thyroxine binding protein by the uptake of labeled hormone in such a secondary weaker binding site as erythrocytes, and if one assumes that an increased T3/rbc value reflects greater TBP saturation by increased thyroid hormone, then, to compare thyroid activity, the total amount of this inter-alpha globulin should be the same in each patient. That this is not always true is demonstrated in Figure I. Here one sees that the euthyroid normal individual has approximately one-third of the TBP bound with thyroxine, the hyperthyroid over one-half and the hypothyroid much less. In pregnancy where it is known that the concentration of TBP is definitely increased (along with the $alpha_1$ and $alpha_2$ complex),[4] the same amount of T4 or even the slight increase of T4 that most women have is bound to a comparatively small amount of this increased total TBP, so that the T3 test results are quite low (beneath those of hypothyroidism values as a rule). Conversely, where there is any condition lowering TBP such as nephrosis, liver disease, etc., a situation obtains favoring high T3 results because the remaining lowered TBP is relatively saturated with a normal amount of thyroxine.

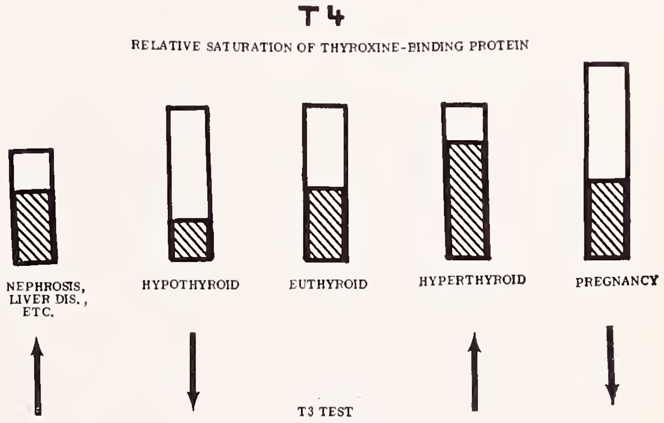
T4
RELATIVE SATURATION OF THYROXINE-BINDING PROTEIN
NEPHROSIS, LIVER DIS., ETC.
HYPOTHYROID
EUTHYROID
HYPERTHYROID
PREGNANCY
T3 TEST

Figure I
Diagramatic representation of the relative saturation by thyroxine of thyroxine-binding protein in various conditions.

To investigate this problem, the T3 tests for a one-year period (1959-1960) at the Hartford Hospi-

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Table I
Euthyroid Patients with Elevated T3 Values

				ELECTROPHORETIC PATTERN			
				GLOBULIN (%)			
PT.	T3 (%)	PBI (UG%)	ALBUMEN (%)	AL-PHA-1	AL-PHA-2	BETA	GAMMA
R.A.	18.6	5.0	60	3	8	14	15
F.A.	17.3 22.0	4.5	34	4	16	13	32
E.B.	19.2	5.6	32	6	12	23	28
W.C.	17.3	6.5	51	7	12	16	14
A.L.	18.9	4.8	49	8	18	17	6
A.M.	18.4	7.2	15	4	6	6	70
R.P.	20.8	5.1	40	7	17	14	22
T.R.	27.4		53	9	8	15	16
F.W.	17.7	5.1	30	6	58		7
D.Y.	17.8	5.5	43	6	20	15	15

tal were studied. Of the 1,000 odd tests performed, (most of them in duplicate) there were 62 determinations with values greater than 17; (the normal range at the Hartford Hospital based on 100 duplicate determinations including those on 24 laboratory personnel and 76 euthyroid patients is 9-17 per cent). Sixteen of the 62 elevated values were present in thyrotoxic patients proven clinically as well as by PBI and RAI values. Of the remaining 46, the elevated values in 6 were never fully explained, but the rest were in patients, 1) with severe congestive failure having laboratory evidence of concomittant liver function derangement, 2) with primary liver disease, 3) with nephrosis, 4) with pulmonary insufficiency having elevated carbon dioxide combining power, or 5) were in patients on anticoagulant therapy. All of those conditions are known to cause elevated T3/rbc values, and we questioned whether obtaining the patterns of plasma protein fractions as routinely accomplished in our laboratory (using conventional paper electrophoresis with veronal buffer at pH 8.6) would aid in clarifying this problem of an increased T3 value in the euthyroid. A possible error with this method of protein fractionation is the "trailing" effect of albumen over to the alpha globulins and this is not seen using a method involving cellulose acetate rather than the usual paper electrophoresis.[5] At the time of this study, however, the latter technique had not been standardized at the Hartford Hospital, and we thought it advisable to compare these T3 results with the protein separation method in common usage at this hospital. Beginning with 10 random patients having normal PBI and RAI uptake values but with elevated T3 figures, electrophoretic patterns were obtained (Table I). Each patient had normal *total* protein concentration. If one considers that with the particular method used, the lower limit for the albumen fraction is 47 per cent, and that the upper limit for alpha$_1$ is 4 per cent and alpha$_2$ is 10 per cent, it is seen that 6 of the 10 patients have lowered albumen values, whereas 7 have elevated alpha$_1$ values and elevated alpha$_2$ values. Only one plasma had normal protein fractions and this patient was receiving dicumerol.

These findings suggest that if one is dealing with a euthyroid patient with a raised T3/rbc uptake, the patient may well possess some abnormality in his or her protein pattern. Paradoxically, however, the abnormality involving the alpha fractions and thus the thyroxine-binding protein, seems to be one of increase rather than what one would expect —a decrease, if the concept of relative saturation with thyroid hormone is carried through to its logical conclusion. One explanation could be that the lowering of the albumen fraction, which competes equally as a secondary binding site with erythrocytes, is the decisive factor in elevating the rbc capture of the I 131 T3. (The fact that three of four plasmas from hypothyroid patients with normal T3 values had significantly depressed albumen concentrations supports this concept).

To reverse the problem, we obtained T3 values on 6 euthyroid patients with such conditions as hepatitis, multiple myeloma, etc. and each having abnormal protein fractions, to see if the T3 results would be elevated as expected. As can be seen from Table II, the T3/rbc uptakes were all normal even in one patient with an albumen of 23 per cent.

One may conclude from this small number of cases that an abnormal protein pattern in itself will not necessarily result in an elevated T3 test, but at the same time if one obtains a T3 result above 17 per cent without thyroid disease, then it is likely that routine paper electrophoresis with veronal buffer will demonstrate some abnormality in the protein fraction concentration. Another consideration that may complicate matters is the fact that protein separation in this manner is undertaken at pH 8.6, whereas the T3 test is performed at the physiological pH of 7.4.

Table II
Euthyroid Patients with Abnormal Protein Patterns

				ELECTROPHORETIC PATTERN			
				GLOBULIN (%)			
PT.	T3 (%)	PBI (UG%)	ALBUMEN (%)	AL-PHA-1	AL-PHA-2	BETA	GAMMA
C.C.	11.6	5.4	38	6	7	11	37
M.C.	16.4	5.1	37	7	21	13	22
A.M.	11.6	7.2	51	5	7	20	18
M.P.	15.5	6.5	23	4	5	7	61
C.S.	16.0	5.5	50	4	18	14	14
G.S.	11.6	6.8	46	5	6	9	39

The effect of pregnancy on the results of this test is most interesting and again exerts itself through a changed protein pattern. Longsworth *et al*[4] demonstrated that the albumen fraction in maternal plasma drops from a non-pregnant mean value of 63 per cent to one of 50 per cent, while the alpha$_1$ portion rises from 4.9 per cent to 6.6 per cent and the alpha$_2$ from 7.5 per cent to 11.2 per cent. Accordingly, the thyroxine-binding protein portion goes up with these increased concentrations of alpha globulins and so there is a marked difference in the binding capacities of TBP in pregnancy.[6] For example, at a blood concentration of thyroxine roughly eight times the normal, the majority of it is still "taken up" by TBP in pregnancy whereas only slightly over one-fouth of it can be retained by this same fraction in the non-pregnant blood at this high level of thyroxine. Thus, because of this significant degree of unsaturation of TBP in pregnancy, the T3/rbc values will be low and usually below that of the blood of hypothyroid patients. Occasionally this change can be observed as early as the 3rd week of gestation and all values should be lowered by the 10th week. For the most part, the value of the T3 determination does not change as early as the various well-known pregnancy tests become positive and lags perhaps two weeks in this respect. An important use of the T3 procedure, however, has to do with vaginal bleeding during the first trimester. In this connection, 42 pregnancies were studied of which 13 were normal and uncomplicated. Of these, 10 had T3 values below 9 per cent and the other three between 9.1 and 9.6 (although our normal range is 9-17 per cent, there seems to be a considerable overlap of normal and hypothyroid patients between 9 per cent and 10 per cent). Five women thought that they were pregnant, but reinforced by a negative physical examination plus T3 values between 9 and 17 per cent, all promptly menstruated! Among these 42 cases were 4 patients with hydatidiform moles, only one of which had a low T3 value. Two of these actually had elevated values and one of these was in eclampsia, so that the probability of associated liver damage must be considered.

Nine women aborted from 15 minutes to 2 weeks after they began to have bleeding. The lowest T3 determination of this group was 10.2 per cent. A "normal" result was obtained in a patient having a stillbirth with congenital anomalies.

Blood was obtained on five women with a history of previous abortions who were not in the first trimester of their current uneventful pregnancy. Their results were encouragingly all below 9 per cent (two of these had T3's between 9 and 17 per cent, 12 and 21 days earlier respectively). Four went successfully to term without incident. The fifth had "spotting" for a short time. This subsided on no specific therapy (the doctor reassured by the low T3 value) and this patient also delivered a normal full term infant at which time an old infarct of the placenta was found and considered to be the source of the earlier bleeding.

TABLE III
PREGNANCY

		ELECTROPHORETIC PATTERN					
			GLOBULIN (%)				
PT.	T3 (%)	ALBUMEN (%)	ALPHA-1	ALPHA-2	BETA	GAMMA	REMARKS
A.K.	8.5	52	9	11	14	14	Normal pregnancy
C.N.	9.6						Normal pregnancy—8 weeks
	7.6	40	7	16	17	20	Normal pregnancy—11 weeks
M.G.	7.4	70	3	5	8	13	Spotting, then ceased
	8.4	51	7	7	23	11	
		43	10	15	22	10	Successful term delivery
R.P.	10.2						Spotting; placed on hormone Rx
	9.0	50 (2 Peaks)	4	9	15	22	3 weeks later; uneventful subsequent course
K.B.	10.2	65	5	2	7	21	Abortion
K.I.	10.2	48	5	13	16	18	Exploratory laborotomy
	10.2	44	2	20	13	22	3 weeks later—abortion
J.B.	13.3						Prior to pregnancy
	12.3	54	6	12	13	16	4 weeks pregnant
	10.2						
	10.0	62	2	8	12	16	
	8.6	58	5	9	15	13	11 weeks pregnant

Five patients were treated with progesterone or estrogen for 1st trimester bleeding. Three had T3's done beforehand with abnormal results for pregnancy. Two had tests performed after therapy and these were now in the low range. All stopped bleeding and went successfully to term. One of these had seven subsequent low values prior to delivery and returned to the non-pregnant level afterwards.

Electrophoretic patterns were determined on 7 of the 42 cases with varied conditions, (Table III). Three with normal pregnancies (A.K., C.N., M.G.) had the elevated TBP (alpha$_1$, alpha$_2$) as expected, the third becoming increasingly "pregnant-like"— (this was the patient who had bled for a few days from a small placental infarct and then went to term). One of those who bled and was successfully treated (R.P., responding with a drop in T3 as well as a cessation of bleeding, had a peculiar double albumen as the only significant change. A typical abortion (K.B.) was accompanied by a non-pregnant pattern. The next (K.I.) aborted probably because of an exploratory laporotomy for a mistaken diagnosis of fibroids. Her alpha$_2$ was certainly elevated, but T3 values were not low at that time. Finally, a series of T3 values were obtained on a patient who was previously a sterility problem (J.B.). It took 11 weeks for the T3 value to be lowered significantly and the protein pattern never really appeared to be "pregnant" but the patient proceeded uneventfully to term. It would appear therefore, that the electrophoretic pattern cannot be counted on always to change significantly but does so in the majority of cases reported in the literature and in the present series.

In conclusion, the T3 test appears to be useful in pregnancy, particularly in evaluating some of the problems of the first trimester. In general, it correlates well with the observed elevation of TBP of pregnancy as revealed by conventional paper electrophresis, and it has proven its value as a laboratory test by remaining at the non-pregnant level in cases of threatened abortion, perhaps allowing time for specific hormonal therapy to be instituted before the inevitable occurs.

Summary

The principle underlying the T3/rbc uptake test is discussed with reference to the effect of the pattern of plasma protein fractions. Cases with elevated T3 values in euthyroid states and illustrative examples in various conditions of pregnancy are presented; possible explanations are offered for the changes observed.

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> For it is well to remember that where a deep feeling of certitude prevades, the logical quality of supporting arguments is apt to be bad. These arguments are likely to be afterthoughts and not the real basis of our convictions.
>
> —Morris R. Cohen, *Reason and Nature*

Foreign Body As A Cause Of Obscure Gastrointestinal Hemorrhage

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Although the ingestion of foreign bodies is not uncommon, perforation and hemorrhage resulting from such ingested foreign bodies is a rare occurrence. The problem of ingested foreign bodies first gained attention when Frederick William I swallowed a buckle and passed it spontaneously.[6, 8] In 1602 a juggler swallowed a knife and the first gastrotomy for a foreign body was performed.[3] In 1735 the first reported appendectomy was performed on a young boy who had a pin perforating his appendix and forming a draining sinus in his right thigh with communication into a right scrotal hernial sac.[2] The following is a case report of obscure gastrointestinal hemorrhage due to a foreign body in the ileum.

Case Report

A 71-year-old white librarian was admitted to the Monadnock Community Hospital,* April 4, 1961. (Case No. 40901) For four or five weeks prior to admission, the patient stated that she had had a lingering "cold." She had symptoms of "grippe" one week prior to admission with mid-abdominal, crampy discomfort for one day with tenderness. There was no change from her normal bowel pattern and no fever or chills. Just prior to admission to the hospital, while at work, she suddenly felt "weak and light-headed," and began to perspire. She had a loose bowel movement containing fresh blood, in large quantity. On the day of admission patient passed a tarry stool with some free blood. She was admitted to the hospital for evaluation.

She had had "hemorrhoid trouble" in the past. There was no previous history of rectal bleeding, nor any suggestion of occult bleeding. The patient stated that intermittently over the years she had had brief episodes of epigastric distress of short duration and non-specific in character. There had been no previous or recent history of alteration in a perfectly normal bowel pattern. About six months prior to the present episode, she recalled an episode of nausea, without associated complaints, lasting for several hours. Her past medical history otherwise was that of a normal healthy individual with no history of physical stigmata of chronic or serious illness. Twenty-nine years prior to admission a dilation and curettage was performed. No further treatment was instituted at this time and the patient had undergone no subsequent difficulty. In 1950, an appendectomy was performed for appendicitis with perforation. System review was not significant except for the fact that she had been tiring easily for the past four or five weeks. The patient's mother died of carcinoma of the colon at age 72, and her father died of typhoid fever.

Physical Examination on Admission: Temperature was normal. B.P. 146 mm. Hg systolic and 70 mm. Hg diastolic. Respirations 20/minute. Patient was a well-developed female who appeared to be younger than her stated age. There was gross evidence of recent blood loss with pallor of the buccal mucosa and gingiva and the conjunctivae. The sclerae were clear. Lungs were clear to percussion and auscultation. No palpable lymph nodes. Heart: normal sinus rhythum with a rate of 96/minute. There was a II/VI harsh systolic murmur over the left precordium from the 3rd to the 6th intercostal space with some radiation toward the base and aortic area. There were no thrills. The heart was enlarged and the aortic second sound was equivalent to the pulmonic second sound. Examination of the breasts was negative. Abdomen was soft throughout. All sounds were hyperactive. There were no palpable organs or masses and no tenderness. The abdomen was not distended. Extremities showed pale toe and finger nail beds. Examination of the rectum showed external hemorrhoids without evidence of bleeding, good sphincter tone, no tenderness or palpable abnormality. There was dark-brown to red stool on the examining finger. Neurological examination was within physiological limits.

Laboratory Data: Admission hemoglobin was 6.95 grams, (44 per cent); red blood count was 2,890,000 per cu. mm.; white count was 10,550 per cu. mm. with a differential of 61 segmented polys, 7 stabs, 19 lymphocytes, and 3 monocytes.

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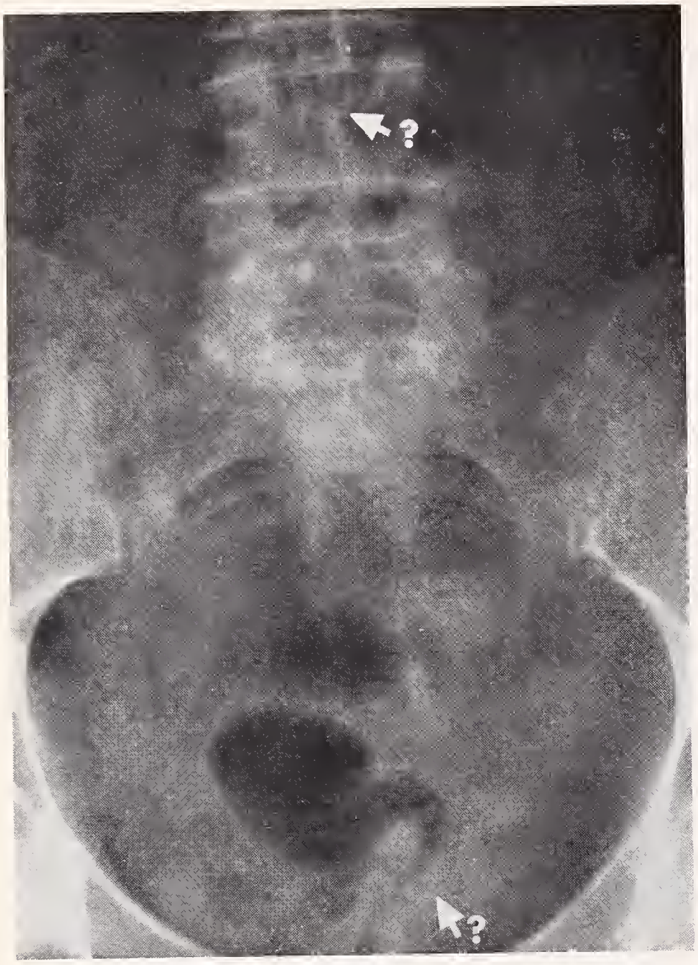

Figure I

Flat plate of abdomen taken during first admission. Arrows placed in retrospect after surgery indicate possible locations of bone.

Hematocrit was 24 per cent. Clean voided urine specimen showed 9-12 white blood cells, 4 plus bacteria, albumin negative, sugar negative, diacetic and acetone negative, specific gravity 1.008. Stool specimen was strongly positive for blood. Serum bilirubin was normal. Platelet count was reported as 92,000. Clot retraction was normal. Reticulocyte count was 2 per cent. Prothrombin time was 75 per cent. Rumple-Leede's test was positive on two occasions. BUN was 15.8 mgm. per cent.

Hospital Course: The patient had no more active bleeding and stools gradually became guaiac negative. Five units of whole blood were given following which her hemoglobin was 12.6 grams, (81 per cent); with a hematocrit of 35 per cent. Satisfactory protoscopic examination was negative. Barium studies of the upper and lower intestinal tract with small bowel follow up showed only a small hiatus hernia. Bone marrow aspiration showed normal marrow. Gastric analysis was done but it was not satisfactory. The patient was discharged on the 13th hospital day improved, and with the source of her hemorrhage not identified. Her hemoglobin and hematocrit on discharge were 11.20 grams, (71 per cent) and 35 per cent respectively.

Interval History: For three days after discharge from the hospital the patient was asymptomatic and feeling normally well. On the 4th day, following discharge, she had a recurrence of abdominal discomfort consisting of mild, crampy periumbilical pain. No associated symptomatology. The stools were checked at daily intervals and were negative for occult blood. The discomfort was intermittent and was not associated with systemic response or associated symptoms. About two weeks following discharge from the hospital, the barium studies of the intestinal tract were repeated and again showed only the small hiatus hernia. Gastric analysis was repeated—no blood was present and no free acid was found. On May 5, 1961, just one month following her first admission to the hospital, the patient had a sudden onset of chills associated with abdominal crampy discomfort and pain in the right upper quadrant radiating to the left lower abdomen. The temperature was 101.4° F. by mouth, the abdomen was soft with hyperactive bowel sounds, and poorly localized mid-abdominal tenderness of moderate degree. The day prior, the patient stated that she had had some mild discomfort and "had taken milk of magnesia and mineral oil for relief." There had been no change in the pattern or color of her stools. There had been associated frequency of urination without dysuria. Urinalysis was negative. On May 8th, three days later, she had lower abdominal discomfort and passed a soft, grossly bloody stool. There had been no recurrence of the chills, the temperature had subsided prior to admission, but the patient was re-admitted to the hospital for treatment of her recurrent gastrointestinal hemorrhage. Physical examinaion on re-admission: the blood pressure was 146 mm. Hg systolic and 72 mm. Hg diastolic, pulse 96/min., temperature was 98.9° F., and respirations 20/min. Physical examination was otherwise similar to the previous admission. The abdomen was soft, bowel sounds were hyperactive, there was no distention, there was mild periumbilical tenderness and some tenderness in the right lower quadrant without palpable abnormal organs or masses. Rectal examination showed only a dark-red, guaiac positive stool.

Laboratory Studies: Showed a hemoglobin of 12.2 grams, (79 per cent), white count of 6,900 per cu. mm., red blood count of 3,650,000 per cu. mm., hematocrit of 36 per cent. Bleeding and clotting time were within normal limits, clot retraction was normal. Rumpel-Leede's test was positive. Urinalysis: clean voided specimen—specific gravity 1.008, slight trace of albumin, 67 white blood cells, 5-8 red blood cells, 4 plus bacteria; some trichomonas vaginalis organisms were seen.

Hospital Course: Gastric analysis was repeated and showed no blood, no free acid, 5 degrees of combined acid and 5 degrees of total acid. She continued to show positive guaiac tests for occult blood in the stool. On May 12, four days after admission; the patient having remained essentially asymptomatic and afebrile, exploratory laporatomy was performed. At operation, the right lower abdominal cavity was obliterated by omental adhesions and matted ileum. The remainder of the abdominal cavity was free of adhesions and there was no visible or palpable evidence of abnormality. A hard mass could be felt in a segment of matted ileum. The "tumor" was dissected free and resected intact. The continuity of the ileum was restored by end-to-end anastomosis. The specimen clearly revealed the source of the hemorrhage. A Y-shaped bone, probably part of the rib cage of a chicken or duck was found. One limb of the Y lay free in the lumen of the bowel and other limb perforated the bowel into the mesentery. It appears that the foreign body had not been able to

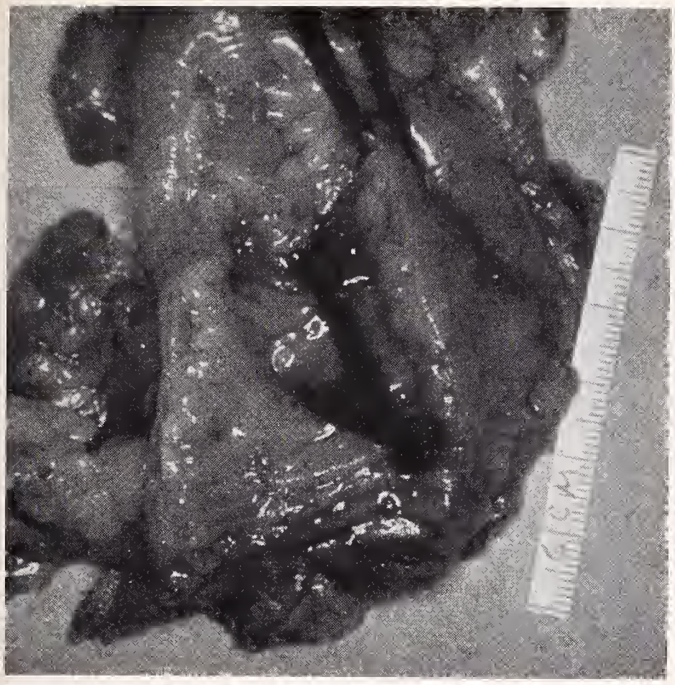

Figure II
Photo of surgical specimen showing bone and segment of ileum.

negotiate the fixed angulation of the matted, small bowel which had resulted from the perforated appendix eleven years previously. The Y-shaped bone had become oriented with the open end of the Y pointing distally, had lodged and eroded through the mesenteric border.*

The patient's post-operative hospital course was uneventful. There has been no recurrence of the trouble.

Discussion

In 1938 Henderson and Gaston[5] reported 800 cases of ingestion of foreign bodies with two deaths out of which there were nine perforations. Siddons[9] thought this incidence of perforation to be high because many people do not seek medical aid. He reported 126 cases in which 107 (85 per cent) passed the foreign body naturally and four had perforation or obstruction.

Gross[4] presented a series of 766 ingestions of foreign bodies and stated that 25 per cent lodged in the esophagus and gave symptoms of choking, dysphagia, or discomfort. Of those which reached the stomach 93 per cent passed through the intestinal tract without incident and only *0.6* per cent caused perforation.

MacManus[7] in 1941 analyzed 93 cases and reported two additional cases of perforation. He found that 50 per cent occurred in the first three decades and a decreasing percentage in succeeding decades. In only one case was there knowledge of ingestion. The types of foreign bodies were grouped as either metallic (45-46 per cent), animal bones (45-46 per cent) or wood splinters (9). Chicken bones were responsible for only four cases.

A majority of perforations (stated exactly in 88 cases) occurred in the lower ileal and cecal regions (20 cases). Appendiceal perforations occurred in 34 cases. Perforations in the gastric, duodenal, and jejunal areas accounted for five cases. Meckel's diverticulum was a frequent site of arrest and subsequent perforation (10 cases). The colon was perforated ten times, the rectum three. There were four cases of perforation of the intestine by foreign bodies while the gut was caught in a hernial sac. In addition the author reported one case and one was previously mentioned.[2] In seven cases in which the exact site was not known the foreign bodies were found lying within abscesses in various recessed of the peritoneal cavity. The duration of symptoms ranged from three hours to 12 years and the author was not able to correlate this with site of perforation. Only *one case* of hemorrhage was found.

The mortality rate was 25.9 per cent. In the series studied before 1900 the mortality rate was 53.5 per cent (18 deaths out of 32) and after 1900 was 10 per cent (6 out of 60). The difference is attributed to early recognition and effective treat-

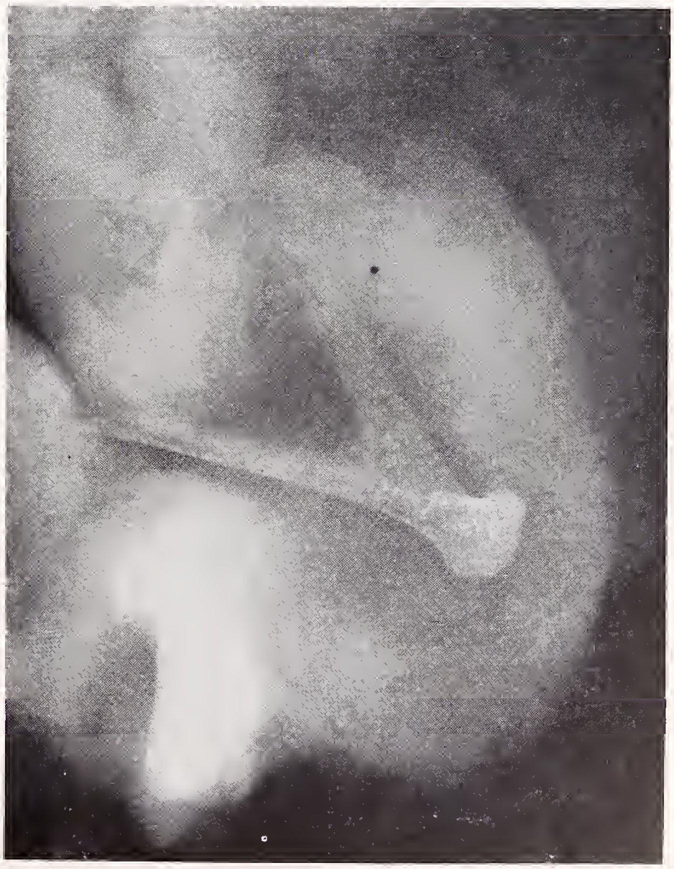

Figure III
X-Ray of bone in ileum after surgical excision.

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ment. The group in which a local peritoneal inflammation or indurated inflammatory mass was found had no deaths in either surgical period. Those with abscesses showed a mortality rate of 52.6 per cent before 1900 and 8.7 per cent after. Those with peritonitis before 1900 universally died and those between 1900 and 1940 had a mortality of 35 per cent.

Bunch *et al*[1] in 1942 reported four cases of acute perforation of the intestine by ingested fishbones. In two cases the site of the perforation was a Meckel's diverticulum, in one case probably the appendix. In one case the fishbone was found lying free in the outer surface of the omentum. In the remaining case perforation of the internal iliac vein by a bone was followed by fatal blood stream infection. They point out in their series that the incidence of perforation in blind segments (i.e., Meckel's diverticulum and appendix) is due to their inability to rid themselves of the offending bone and peristalsis forces it onward.

MacPherson *et al*[8] in 1957 reported six cases of foreign body perforation (with one fatality) of the intestinal tract. The age group varied from 47 to 80. One gave a history of ingestion and five of the six wore dentures. The authors felt that the lack of normal palatal and gingival sensation probably played an important role. Four of the six had a history of operative evidence suggesting chronic obstruction; the remaining two had hernias. In the older age group chronic obstruction due to hernia, post-operative adhesions or atony of the bowel is more frequent. The authors correlate their incidence of perforation with both advanced age and obstruction. The authors also stressed other factors such as poor vision, mental infirmity, rapid eating, drug addiction, a dare and absent-mindedness.

Summary

A case of ingestion of a fowl bone (most likely part of a chicken rib cage) leading to perforation of the ileum and subsequent hemorrhage is presented. The patient was an intelligent married female who wore dentures and who in retrospect gave a probable history of knowledge of ingestion. Perforation and hemorrhage from the rather frequent ingestion of foreign bodies is rare. A significant percentage occur in the ileal and cecal regions as in the case presented. A brief review of the literature is given.

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Our greatest problem is to confront the urge to self-destruction.

We must not feel hopeless. If every man of good will will do what is in his power, then there is no dark fate.

—Martin Buber

Stages In Scientific Inquiry

Part II

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THEORIES and hypotheses are the means of scientific explanation, that is, they relate otherwise unrelated statements. As we have already said, the relationships of statements are often in two different categories—it can be that one is a specific example of the other, or that both are aspects of the same problem area. The exact nature and differences between theories and hypotheses is not clear, but it may be that the former refer to cases of relating a specific case to another more general situation. For example, the theory of gravity shows that Kepler's laws are really cases of the general situation of the mutual attraction between all bodies in space. Or, again, the chromosome theory of heredity shows that the behavior of Mendelian factors is a case of the general behavior of chromosomes during meiosis. Or, finally, evolutionary change is a consequence of natural selection.

The hypothesis, on the other hand, relates statements of the problem area, as in the example previously given of the hypothetical Mendelian factors; their behavior accounts for the enumerative inductive generalizations from Mendel's breeding experiments.

In both hypotheses and theories the type of logical inference is deductive or analytical, which is to say that what is to be explained is a deducible consequence of the theory or hypothesis—Kepler's laws are deducible from the theory of gravity, the behavior of Mendelian factors is deducible from chromosomal behavior, and phenotypic ratios are deducible from the properties of Mendelian factors. It is this quality of logical necessity—the deducible consequence—that makes clear some of our earlier comments on causality, specifically, those dealing with the "if A, then B" form of causal statements.

Now what is to be done when scientists persist in calling a given type of statement both a theory and a law, as in the case of gravity or evolution? Or, more confusing, when one says "A theory is not a law, . . ." (Campbell 1920, p. 299) and others say ". . . every law is also a theory . . ." (Hempel and Oppenheim 1948, p. 345)? One obvious point is of course to examine the context of their assertions, and as in the case of the two quotations just given it is obvious that the whole intellectual orientation of the quotations is sharply different. We reach a point where we leave the proper function of this paper if we were to try to resolve the proper semantic problems involved. Our purpose is fulfilled if we recognize the differences of opinion and make clear the meaning of our own use of terms.

To us it seems useful to distinguish between laws and theories. The distinction is two-fold. First, laws are derived by an inductive process which accumulates data and then generalizes from them. The final generalization may be well removed, as by retroduction, from the original observations but nonetheless they are basically and quite directly dependent on observation. On the other hand, though a theory may arise as a hunch and be as intuitive as the ordering pattern of a retroduction, its relationship to other statements is of a deductive sort or analytic.

The second distinction between law and theory is the function of these two types of statements. Laws are descriptive. Theories are explanatory. Laws describe existing situations whereas theories (also hypotheses) try to explain them. In that Kepler's laws are seen as deducible consequences of the theory of gravity we say these laws are explainable by that theory.

This brings us to a subject which is as important as it is difficult and complex and that is to determine when statements are descriptive and when explanatory. Specifically, what distinguishes retroductions or intuitive inductions from hypotheses? The difficulty is dual in that, first, hypotheses like retroductions are concerned with relating statements within a given problem area, which in some respects is a descriptive function. Second, retroductions like hypotheses have an explanatory value in that they state new relationships (= intelligible patterns) between observational generalizations.

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As a result, perhaps, of these similarities we find that some people make no distinction between retroduction and hypothesis. For example Braithwaite (1955, esp. chap. I and XI) consistently synonymizes laws (= retroductions in this paper) and hypotheses. (See also Kneale (1949) for another treatment of this subject.) Pragmatically, it must be admitted that statements can be both descriptive and explanatory to varying degrees. But as we shall try to make clear in the last section of this paper—in the context of discussing Mendel's laws and Darwinian evolution—it does seem possible and useful to distinguish between retroduction and hypothesis, but the distinction will be on grounds other than simply description vs. explanation.

The third and last topic in this section is the testing of an explanation. Here again we are concerned with deductive statements for hypotheses and theories are tested by examining their predictions, and predictions are the deducible consequences of these explanatory statements. Predictions in this sense have a quite different function than predictions as used in some cases by morphologists where predictions are an extension of inductive generalizations (Remane 1955, p. 168). In such instances, for example, from knowledge of the observed presence of ostia in the hearts of certain insects it is predicted that all insects will have ostia. Such predictions are simply extensions of the generalization which has already been made; in one sense they are a kind of test of the generalization. This testing becomes quite important when we move from enumerative induction to intuitive induction or retroduction, for in the latter the creative element introduces an element of uncertainty which scientific precision is obligated to test. We need to know, for example, if the mathematical equation which "coagulates" the elements of inquiry into an intelligible pattern is indeed valid, and the validity is determined by deducing predictions and seeing if they are fulfilled.

Deduced predictions, whether testing a theory or retroduction, are often examined by use of experiments. But in giving experiments the role of testing predictions we have yet omitted one other capacity in which experiments function, i.e., as mentioned earlier, in the extension of a description. Most experiments in biology are of this latter nature; all variables except one are held constant "to see what will happen." "What happens to growth rate if the temperature is raised 10°C?" "What happens if the developing chick embryo limb is rotated 90°?" "What happens if the medium is depleted of a certain amino acid?" Biologists refer to this kind of inquiry as "doing an experiment" and answers from these experiments fill out our descriptive knowledge of growth, development, nutrition, etc., following which inductive generalizations can be made. Then experiments can again be used to test the generalizations, and, again, to test the explanation of these generalizations.

Selected Biological Concepts

There remains now to examine certain major concepts in biology. We do this to show how misleading the imprecise use of terms such as a theory and law can be and, more importantly, to illustrate the major thesis of this paper that an awareness of the stages of scientific inquiry is useful in evaluating where we are in understanding a given problem in science. We shall examine in turn the so-called "cell theory," Mendel's laws, and the idea of Darwinian evolution.

The cell theory is not a theory; it is an enumerative induction. Wilson (1928, p. 2) in his great work on the cell states: "By force of habit we still continue to speak of the cell 'theory' but is a theory only in name. In substance it is a comprehensive general statement of fact . . ." Schleiden and Schwann concluded from observing the cellular structure of a limited number of plants and animals that all plants and animals were so constructed. This foundational conclusion remains steadfast today, but not so their ideas on the origin of cells and the role of cells which is what they had in mind regarding the cell theory. Their views are exemplified by the following.

"The development of the proposition, that there exists one general principle for the formation of all organic productions, and that this principle is the formation of cells, as well as the conclusions which may be drawn from this proposition, may be comprised under the term *cell-theory,* using it in its more extended signification, whilst in a more limited sense, by theory of the cells we understand whatever may be inferred from this proposition with respect to the powers from which these phenomena result." (Schwann 1839, p. 165-166).

It is difficult, at best, to find in the foregoing an explicit explanatory statement and almost impossible rigorously to deduce testable predictions from this enunciation of the cell theory.

It is not to be denied however that the idea of cellular construction was important to biology. It has been referred to, somewhat extravagantly to be true, as "The most decisive step in the development of biology into a scientific discipline . . ." (Ephrussi 1953, p. 1). Virchow, among others, developed the cell republic idea (see esp. Sharp. 1934, chap. XXVI) to its extreme in proposing that organisms are the secondarily formed aggregations of a vast number of elementary individuals, the cells. But this proposal is an attempt to explain organism, not cell, and should be considered a part of an "organismic theory," not "cell theory."

In brief, there is no cell theory today; there is no widely formulated notion of what such a theory might explain. We have today extraordinarily detailed pictures of the cell, but no one has formulated a general problem (a retroductive statement of the sort Kepler supplied for planetary motion) which cries out to be explained. This is one of the major intellectual hiatuses of biology today and it is glossed over and missed largely because the phrase "cell *theory*" lulls us into a false sense of understanding.

Mendel's laws we have already referred to as hypothetical constructs. They are not laws because the function of these concepts is to explain rather than to be a summary of the breeding studies. These so-called laws—segregation and independent assortment—are actually hypothetical properties attributed to the basic hypothetical construct of the hereditary factor. In many ways the Mendelian factor is a 19th century forerunner of the model building that earmarks much of the excitingly successful molecular biology of today. However, Mendel's whole concept (the model) of hereditary factors seems to this writer to be very close to an intuitive induction or retroduction, for the concept is derived directly from observational or enumerative generalizations and it relates to nothing other than these generalizations. It differs from a typical retroduction such as Kepler's laws or Darwinian evolution (see below) in that it contains a hypothetical construct, i.e. the mendelian factor. It is on this basis that it seems possible to distinguish hypotheses from laws or retroductions, as we have chosen to refer to them here.

Finally there remains for brief consideration Darwin's revolutionary contribution to the study of man and the organic world around him. Here we can see scientific inquiry carried through all the stages, from description, through explanation, to testing of the explanation.

Darwin states:

"During the voyage of the *Beagle* I had been deeply impressed by discovering in the Pampean formation great fossil animals covered with armor like that on the existing armadillos; secondly by the manner in which closely allied animals replace one another in proceeding southwards over the continent; and thirdly, by the South American character of most of the productions of the Galapagos archipelago, and more especially by the manner in which they differ slightly on each island of the group; none of these islands appearing to be very ancient in the geological sense.

"It was evident that such facts as these, as well as many others, could only be explained on the supposition that species become modified, and the subject haunted me. But it was equally evident that neither the action of the surrounding conditions, nor the will of the organisms (especially in the case of plants) could account for the innumerable cases in which organisms of every kind are beautifully adapted to their habits of life . . . I had always been much struck by these adaptations, and until these could be explained it seemed to me almost useless to endeavor to prove by indirect evidence that species have been modified." (from *Charles Darwin's Autobiography* p. 57-58).

The problem that Darwin formulated was dependent on the generalizations obtained from direct observations of fossils and zoo-geographical distribution. His own account indicates no conscious lingering over enumerative generalizations from these data, but a step directly to a retroductive concept, the idea that species are not immutable, as he originally believed, but that they change in time. Darwin calls this idea of change an explanation (see quotation) and indeed so it is, in the sense that it interrelates his data—it is again a case of the elements of the inquiry, the problem area, being coagulated into an intelligible pattern. But Darwin clearly saw the further problem of explaining how this change occurs, and of simultaneously explaining adaptations. This he achieved by the theory of natural selection. Natural selection is a theory in every sense of the term: its function is explanation; Darwin's postulated change is a deducible consequence of it; it relates the postulated change to otherwise unrelated statements concerning reproductive potential and heritable variations in organisms; and lastly it gives rise to testable predictions.

This approach, despite its unwanted overtones of seeming to force Darwin's line of thought into a very pedantic mode, is useful for several reasons. It allows us to see more clearly the conceptual difference between evolution and natural selection, the former being a retroductive concept verging on hypothesis and the latter a theory of the most meaningful sort. It also makes clearer the criticism often directed at the theory of evolution which is its low predictive ability (e.g. Scriven 1959), for evolutionary change as postulated by Darwin is not a theory, it is basically a restatement of the enumerative inductions arising from paleontological and zoogeographical distributions. Darwin's followers started calling it a theory and then demanding of it what is normally asked of a theory, that is, predictability. Darwin, himself, speaks of a theory when he refers to natural selection. But even this theory, it is stated, ". . . cannot make reliable predictions, except through such trivial and meaningless circular statements as, for instance: 'The fitter individuals will on the average leave more offspring'." (Mayr 1961, p. 1504). This claim can be challenged (E. D. Hanson 1961) and we can find a wide array of important consequences deducible from this theory and capable of being tested, consequences concerning natural and laboratory populations, ecology and the concept of niches and the Gause principle, rates of evolution, and the nature of adaptation itself.

Conclusion

Having tried to make clear the stages of scientific inquiry, having attempted definitions and clarifications of key concepts along the way, we have concluded by briefly examining three of the major ideas of biology. In the process we find one, the cell "theory", to be a misnomer and rather than a major *explanation* of biological organization, it is seen simply as a major *description* of that organization. And more importantly, there is revealed a complete absence of any conceptual framework which even attempts to explain why organisms are organized on a cellular basis. The "laws" of heredity are better seen as part of a hypothetical model which explains the pattern of hereditary transmission. Though such models have much in common with retroductive statements they differ in one important and obvious feature which is the introduction of a hypothetical construct or model. This feature, it is suggested, is of use in distinguishing laws and hypotheses in general. Such models are of increasing importance in contemporary biology and, hence, knowledge of their formulation and use is of value. Finally the concept of evolution is a law-like statement and a consequence of the theory of natural selection; it is the theory that is to be examined for testable predictions (as it has been successfully examined) and not the law in this case. Evolutionary change is most usefully considered a brilliant retroductive insight by Darwin which reinterpreted an accumulated mass of observational data, refocussing attention so that its explanation by the process of natural selection was made more probable, if not inevitable.

Re-examination of these three topics does, therefore, lead to revaluation, especially regarding the cell "theory"; it does aid in understanding them, as in the conceptualizing of the role and use of models such as Mendel's; and it does clarify the different aspects of a complex topic like evolution. The benefits of this approach are, of course, not to be limited to re-study of already completed work; they are imminent wherever and whenever scientific inquiry is in progress.

Summary

Explanation is a deductive or analytical problem centering on causally relating otherwise unrelated statements. The testing of explanations depends on analytically derived predictions which are testable.

The three biological ideas examined in the light of the preceding discussion are the "cell-theory," Mendel's laws, and evolution. The "cell-theory" is seen to be not a theory but an enumerative induction. An explanation of cellular organization is totally lacking in contemporary biology. Mendel's laws are part of a hypothetical model he used to explain an observed pattern of inheritance. The term "law" is misleading here in that it suggests a descriptive concept rather than an explanatory one associated with a hypothetical model. Finally, Darwin's idea of evolution is seen as a retroduction rather than a theory. Natural selection is the theory which explains evolution. This formulation of the distinction between these two concepts allows us to more readily understand some of the criticisms recently directed at the idea of evolution.

Acknowledgment

The author wishes to express his thanks to Mr. Daniel E. Keim for reading the manuscript and contributing many useful comments and criticisms.

This is the last of a series of two articles.

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A Survey Of Connecticut Hospitals On House Staff Remuneration And The Cost Of Financing House Staff Education

Conducted Jointly by

THE COMMITTEE ON HOSPITALS, CONNECTICUT STATE MEDICAL SOCIETY
THE COMMITTEE ON PROFESSIONAL PRACTICES, CONNECTICUT HOSPITAL ASSOCIATION

THE Joint Conference Committee, composed of the Committee on Hospitals of the CSMS and the Council on Professional Practices of the CHA, conducted a survey of all Connecticut hospitals designed to obtain factual data concerning House Staff remuneration and the cost of financing House Staff education. An analysis of this survey with a set of primary recommendations is set below for the approval of the Council of the CSMS and the Board of Trustees of the CHA .

The period of the survey covers the year from July 1, 1961 to June 30, 1962 and includes reports from thirty-two of the thirty-four General Community hospitals and from all fourteen of the Class I and Class II hospitals. This represents better than 95 per cent return of the questionnaires submitted by the Committee. The two hospitals which failed to answer the survey, it is felt by the Committee, will not affect the results to any degree because of the fine response by the entire hospital group.

Seventeen of the forty-six questionnaires returned were from hospitals that have no house staff at all. Of this number, thirteen were from General Community hospitals and four from Class I and II hospitals. Thus, 44.9 per cent of the Community hospitals and 28.5 per cent of the Class I and II hospitals have no interns and residents. In other words, almost half of Connecticut's General Community hospitals have no house staff at all. One of the thirty-two General Community hospitals maintains a single residency program, having lost its internship approval within the last two years.

Nine of the fourteen Class I and II hospitals have only residency programs because of the nature of medical care given in these institutions e.g. psychiatric training, specialized pulmonary diseases or orthopedic training. This makes a total of ten hospitals with only resident programs.

Eighteen of the thirty-two General Community hospitals and one of the fourteen Class I and Class II hospitals have both interns and residents on their house-staff. Thus, 54 per cent of the total number of Connecticut hospitals have both interns and residents.

The total number of interns being trained in Connecticut hospitals during the period of this survey is one hundred seventy-two, all of which receive a rotating internship except in one general hospital where the internship is of the straight type. Five hundred ninety-nine residents are in training and all types of residency training are represented by the hospitals. This gives a grand total of seven hundred seventy-one interns and residents in some degree of training throughout Connecticut's hospitals. This house staff is being trained in nineteen General Community hospitals and ten Class I and II hospitals, a total of twenty-nine hospitals out of a possible forty-six that actually answered the survey. The discussion of an analysis of the relationship of house staff to beds in a hospital was not undertaken at this time, but will be reviewed at a later date by this committee as a secondary project.

The survey then studied the remuneration and benefits received by the house staff in the hospitals of Connecticut. Intern studies will be presented first. The lowest salary received by an intern is $1500/year and the highest is $4500/year. The largest proportion, however, receive about $300/month or $3600/year. Additional remuneration, especially in the lower groups, is given as various types of benefits. Examples are as follows:—

1 — $25/month additional salary if married, plus $25/month per child to a total of three children.

2 — $500 Bonus at the end of the year.

3 — $250 additional sum for the year if the intern lives off the hospital premises.

4 — $75/month additional remuneration if the intern is married.

5 — $80/month additional remuneration if the intern is married.

6 — $60/month additional remuneration if intern is married and living off the hospital premises.

Additional benefits over and above his remuneration, are given to the intern by all the hospitals and add materially to the cost of his maintenance. Examples of these benefits are as follows:—

1. Fifteen hospitals provide rooms and board for the interns, eight give him an apartment if he is married, two of the latter hospitals charge for his room at cost.

2. Eighteen of the hospitals provide laundry service and seventeen provide the intern with uniforms.

3. Ten hospitals provide Blue Cross protection and hospital expense. Four others provide Blue Cross coverage if the intern desires it and one hospital adds life insurance (amount not specified) during the interns stay at the hospital.

4. Fifteen hospitals provide full hospitalization free for the intern and his family, one only for the intern.

5. Ten hospitals provide malpractice insurance for the intern; the amount of coverage is not specified and is very variable as discussions with some of the hospital administrators have indicated.

Resident remuneration is next considered and the survey was so worded to study differential salaries in the successive years of residency training. State and federal hospital returns were separated from general community hospitals due to marked differences in results as will be pointed out below.

The lowest salary for first year residents is $2400/year and the highest for a first year resident is $4800/year. The largest proportion of first year residents receive about $3000/year and have an annual increment of $300/year as they achieve chief resident status. Thus, the chief resident will receive $4200/year although one hospital pays up to $4800 for such a resident. That hospital which begins a resident at $4800/year indicates little progression in training for the house staff. One hospital only reaches $2400, the same as the first year resident.

State and Federal institutions begin their remunerations of residents at about $4800/year and give increments up to a total income of $7200/year for their chief resident.

Residents in training also receive additional benefits as do the interns and examples are as follows:—

1. Board and room is provided by fifteen hospitals and five other hospitals charge a nominal amount for board, room and laundry.

2. Four hospitals provide an apartment or house if the resident is married while four other hospitals give added remuneration (amount not specified) to a married resident in lieu of an apartment.

3. Laundry and uniforms are provided by seventeen hospitals.

4. Blue Cross protection is provided free for the resident and his family in fifteen hospitals.

5. One hospital gives life insurance protection (amount not specified) to the resident while in training at that hospital. Another hospital adds major medical protection for the resident.

6. Seventeen hospitals provide free hospitalization for the resident and his family.

7. Eleven hospitals provide malpractice coverage for their residents (amount not specified).

Studies were conducted in this survey regarding post-residency or fellowship programs in order to learn how many hospitals provide this type of training. Twenty-four hospitals with intern and residency programs do not provide any such training at all. The remaining five do have various types of post-residency or fellowship studies in progress. The remuneration received by such fellows is extremely variable. One hospital pays $7200-7500/year for a post-residency student, another provides $10,000 but this includes the cost of equipment. A third and fourth hospital provides from $1500/year up to $6000/year depending upon the type of study program the fellow is pursuing. Lastly, a fifth hospital has an occasional study program in post-residency work, offering varying degrees of remuneration depending upon the project studied. These are financed by the state in one case and by the hospital in two cases, by a special fund subscribed by outside organizations in a fourth case and by varied manners in a fifth case. Additional benefits of room, board, laundry, etc. are not included in these post-resident programs or fellowship studies. It is with interest, to note that five hospitals in Connecticut do look for and provide training and studies over and above residency levels for those who desire such work.

The next series of questions in the survey had to do with the Intern-matching plan of the AMA and the ability of the hospitals to obtain satisfactory results from participation in this program.

Sixteen hospitals indicated that they have some degree of difficulty in obtaining interns under this program whereas four feel they had no trouble at all. The degree of difficulty when interpolated to the number of interns obtained to those allowed varies as follows:—Seven out of thirteen in one hospital, two out of sixteen in another and is as bad as one out of ten, none out of nine and none out of seven in other hospitals. This situation has to be correlated to the type of education program offered by the institution, as well as the remuneration, the number of available interns and is a matter of concern for this committee. The remuneration received by the intern does not appear to be a deciding factor. The four hospitals indicating no difficulty in obtaining interns provide a very satisfactory and thorough educational program. They are able to fill quotas from the matching program as follows:—Ten out of ten, seven out of seven, eighteen out of eighteen and forty-nine out of forty-nine.

In studying the survey, in all fairness, it must be stated that many of those hospitals having difficulty in obtaining interns, do offer satisfactory training programs and probably suffer due to the lack of available interns. It is most important to note that of thirty-four general community hospitals in Connecticut, only one is a University hospital and the other thirty-three are true community hospitals. Therefore, this problem of obtaining a satisfactory number of house staff personnel affects the state throughout its entire hospital environment and it is imperative to correlate all our efforts in medical and hospital work to help overcome the situation.

The next series of questions in the survey are inter-related and are grouped together in this study. The questions all pertain to the educational programs given to the house staff during his training. All the hospitals which have house staff, provide some degree of an educational program. Each respondent to the questionnaire had to, of necessity, express his opinion regarding the thoroughness and quality of the educational program in his hospital. It is difficult to make dogmatic statements concerning this section of the survey, but it is obvious that all hospitals realize the need for a good program of education and that each hospital is constantly improving its program. Not only is improvement being made in quality and thoroughness, but most important, in the proper administration of such a program.

All the hospitals claim some type of degree of University affiliation, varying from medical school professors lecturing regularly to the house staff in a unified course to actual intern and resident exchange work being done. One hospital receives its resident from the university program.

The importance of the educational program is realized by many hospitals and they are actively engaged in concrete action to improve its quality. Some of the developments include the appointment of full or part time directors of education. Four hospitals have such positions already filled on a full-time basis, two others give an educational director an extra duty. Eleven hospitals provide educational directors on a part time basis. By this is meant that the educational director has his own private practice or has another primary function in the hospital, e.g. pathologist. This situation is obviously not satisfactory as the remarks in the survey indicate that many of these hospitals are now considering the employment of full-time directors, or physicians who, while part time for education, will receive an income from this work. Two hospitals have already adopted this latter procedure with satisfactory results in educational program improvement.

Those hospitals with only residents in training include many of our State and Federal institutions and three of these have full-time educational directors, and seven others give their educational directors secondary minor duties.

No figures are given by the survey as to the income received by those physicians from their work as educational directors.

An effort was made to study the cost and methods of reimbursement for payments made for the educational programs conducted for the house staff. The time given by members of the medical and hospital profession to these programs was not surveyed as this matter was felt to be beyond the scope of the survey. However, the individual efforts of those involved in such a program is fully appreciated by this committee and its importance is not to be minimized.

Eleven hospitals meet the full cost of the educational program out of their current and operating funds. Seven hospitals receive additional funds from the physicians of the staff, two hospitals also receive additional funds from outside sources such as foundations established by interested people and the general community is allowed to participate. This latter plan has worked most satisfactorily from remarks made in the survey. Another method of receiving funds arises whenever physicians may do special types of favors or give grants to individual house staff members to help him overcome personal problems during his training years. This factor is difficult to assess as to amounts but apparently is important in two hospitals in Connecticut.

The committee is reluctant to decide where the full responsibility to meet the cost of education of the house staff lies as this problem has many facets and intends to discuss this further. However, the community which is benefitted by a good house staff must be included in this matter.

In State and Federal institutions, the costs of the educational program are provided as part of the entire cost of hospital maintenance.

The actual cost of intern and resident remuneration plus the cost of the educational program is a very major one and does raise the cost of hospital care for the patient. The survey tried to break-down this cost to know where the majority of money is spent, but the answers failed to give a good break-down except to state that the largest item is in the remuneration given to the intern and resident as his salary. The actual amounts spent by hospitals according to this survey vary markedly and depend, as expected on the size of the house staff. Examples of this total cost are as follows:—

$9,000 per year in one hospital for educational work alone, $143,000 per year in another hospital, $195,000 per year in a third hospital, $147,000 in a fourth hospital, $228,000 and $450,000 in hospitals with a large house staff. As you can see, these amounts vary considerably and are proportionate to the house staff size.

Lastly, from the survey, it is obvious that the training program is the principal reason that an intern chooses an individual hospital for his training. The largest proportion of hospitals classify training program as the principal reason for an intern choosing that hospital. There is an occasional comment as the second reason being remuneration on the hospital locale.

Recommendations

In view of this survey, the following recommendations are made:

1. Each hospital and medical staff actively pursue a continuing program for improvement of the educational aspects of its house-staff training.
2. The CSMS continue actively its liaison work with the Council on Medical Education and Hospitals of the AMA, in order to effect a more equitable distribution of available house staff.
3. Each hospital board and medical staff *consider the advisability* of jointly examining and defining their proper areas of responsibility for the development of methods to accomplish the objective of lessening economic pressures on the house staff, including, if possible, a definition of their mutual objective in the matter of what constitutes "a living wage" for house staff personnel in training.
4. Each hospital board and medical staff *consider the advisability* of jointly inviting the local community to share with them the responsibility of furthering the education of house staff personnel, possibly through the mechanism of providing voluntary financial assistance.
5. This survey report is to be sent to all hospitals and Chiefs of Staff in the State of Connecticut for use as a guide in solving local problems.
6. This survey report, with its recommendations, be published in Connecticut Medicine.
7. A copy of this survey report and recommendations be sent to members of the Education and Hospitals Division.

Approved by the Council, Connecticut State Medical Society 3/21/63.

How odd it is that anyone should not see that all observation must be for or against some view if it is to be of any service at all.

—Charles Darwin

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EDITORIALS

Let The Buyer Beware

Not long ago, we turned on our television set to look in on a well-publicized NBC documentary titled: "White Paper on British Socialized Medicine." As we flipped the switch and waited for the tube to warm up, we felt our receding back hair starting to bristle with anticipatory indignation because our previous experience with this type of TV fare has mostly been pretty bad and has, more often than not, left us hypertensive and grumbling.

As it turned out, we needn't have worked ourself up so. In the main, the piece turned out to be as objective as anything we've seen up to now and presented a reasonably balanced expression of opinion between those who think National Health Service is a smashing success and those who find much of it not to their liking. The doctor, the man-in-the-street and the politician all received about equal time in which to have their respective says, the American Medical Association didn't get to be hung in effigy (although occasionally one could sense that the noose was close at hand!) and the show came to an end without suggesting that the United States ought to move ahead into socialized medicine—at least not right away.

As we watched the program develop and, later, as we mulled over what we had just seen, we suddenly found ourself deeply puzzled about one thing—a thing which was sort of subliminal in nature. Some 25 per cent of the film—in divided doses—was devoted to showing us a "typical" practitioner seeing patients in his office. There were both children and oldsters in the lot—a few really sick (we would guess) and a good many who appeared to have dropped in merely for a bit of advice and a kind word. The hardworking doctor certainly seemed to be doing his job in manful fashion, wagging his finger playfully at the babies and joshing intimately with most everybody. Just like we used to do, we thought, back in the dim, dark past when we were in practice.

But something about the whole picture didn't seem right. What could it be? What was it that seemed so different from Medicine, U.S.A.? Suddenly it came to us! No matter how many patients he saw, and no matter what their complaints were, the physician never once got up from his desk! Not a single time did he repair to an examining room to do his auscultating, percussing and palpating. He just sat there in his chair and did every bit of his diagnosing and treating on this one, isolated spot! And with a minimum of talk.

Our first reaction to this rather bizarre (to us) method of looking into every ailment from the sniffles to advanced cardiac decompensation was that the technical requirements of making the film probably precluded a lot of moving back and forth from one room to another; probably made it impractical to record more than a word or two of history; probably made it prohibitive to show the physician doing much more than taking a peek at the conjunctivum to detect anemia or poking at the abdomen through thick layers of clothing to elicit tenderness. What doctor, we asked ourself, could reach a reasoned conclusion after making such a superficial examination of the patient and his complaint? Couldn't possibly! Must be that the limitations imposed by time and the camera made it necessary to just skim over the surface like that in trying to depict how well the ailing and the medic get along with each other nowadays in merrie olde England.

We were just about ready to accept our own explanation of this phenomenon and settle down to thinking some more about how wonderful things seemed to be for everybody over there; how happy most physicians said they were with the system; and how unworried the people said *they* were, now that no fees were ever charged. But all of a sudden we knew we were wrong! What was it the practitioner who had been shown seeing these dozens upon dozens of patients had said? He said: "Of course we can only allow them about two minutes apiece at the most. Often, it's considerably less than that but very seldom more. For instance, if all they want is a re-fill of some medicine (*medsin*, he pronounced it) we can fix them up in a jiffy, especially if my nurse writes out a bunch of prescriptions ahead and I just have to sign them. We can't waste much time, you know, else we'd never get finished."

And there we had it! That was the hidden ingredient in Britain's National Health Service! Quantity be praised and quality be damned! No wonder the poor doctor never moved away from his desk—no chance to. No wonder patients never undressed—couldn't even get down to their skivvies in two minutes. Press the buzzer—Next! Press the buzzer—Next! Why, in this country, we've seen a veterinarian take longer than that to look after a pup with the pip—on ward service! And, remember, dogs don't usually insist on talking a lot about their symptoms. They'll mostly settle for just a good, thorough physical.

In truth, the NBC documentary seemed to us like a pretty good show. We thought we detected a smidgen of editorial bias now and again but, on the whole, we found it to be passingly fair and objective. The lofty phrases of the Minister of Health came over strong, and the "in favor" testimonials of quite a number of practitioners seemed heartfelt if somewhat stereotyped. The audio portion of the presentation, we thought, made socialized medicine sound palatable even if not at all to our own, personal taste.

But the video part is what proved to us, at least, that a picture can often be worth a thousand words. For to observe the clock-watching, buzzer-sounding, quickly-in and quicker-out brand of medicine which it has fallen to our British colleagues to practice was a truly shocking experience for us. No matter what of good the system may have brought to the people of Great Britain, this one almost unbelievable shortcoming has served to convince us more than ever that we don't want anything like that over here—no matter how cheap it can be gotten. We are reminded of the time a fast talker at a roadside stand tried to sell us some wilted pansy plants at ten cents a box. We didn't think they were worth much—even if a few could be revived—and we didn't buy any. That's more or less how we feel about socialized medicine after viewing the NBC "White Paper."

W.R.R.

The Lethal Factor In Shock

In a search for the basic mechanisms leading to the irreversible state of shock, experiments have proceeded along at least two basic lines. In one, intensive search has been made to discover what happens in the disorganization of the cells in various organs at the molecular level, under the conditions in which the circulation declines to such a point where the metabolic needs of cells are no longer met.[1,2,3] Under such circumstances there accumulate products of cellular metabolism such as CO_2, lactate, pyruvate, a fall in pH, as well as changes in the local oxidation-reduction systems. In spite of the great amount of work done in this area, Levenson *et al*[3] are prompted to state that "we are just on the threshold of understanding what is going on." There is no doubt that a series of biochemical changes do follow shock, but it is not known whether any of these changes cause "irreversibility."

The other line of investigation consists of observations on the circulation through organ systems and the pathologic changes that result when stagnant hypoxia from inadequate peripheral blood flow as it affects various organs in the body. It is to be expected that some organs would fare better than others. The brain and the heart appear to be privileged organs whose circulation is maintained long after other organs have begun to show serious reduction in their blood supply. Some organs like muscles, skin, and kidneys are more resistant to hypoxia. For this reason only mild and frequently variable changes have been described in heart, brain, muscle, skin, and kidneys in shock. On the other hand the intestines, liver, and adrenals seem to be the most vulnerable. Since the liver receives its major blood supply from the intestines, it might be expected that it is in the intestines where one must look for the lethal factor in shock.

Longerbeam *et al*[4] have studied blood flow in organs and changes in the blood in dogs in shock caused by a variety of factors, such as hemorrhage, superior mesenteric artery occlusion, epinephrin and endotoxin injections. The features which appear to be related to the development of the irreversible state in shock are increasing hemoconcentration, so that the hematocrit rises, the plasma volume declines up to 40 per cent and the plasma hemoglobin increases. In addtiion to these changes in the blood there is a tremendous increase in the catecholamines in the blood, the epinephrin content increasing 70-100 fold and the nor-epinephrine content 10-20 fold within 30 minutes following the onset of hemorrhagic shock. As hemoconcentration increases, the cardiac output declines and there results a great reduction in blood flow to the various organs, but the greatest decrease occurs in the superior mesenteric artery in which flow is reduced to less than 20 per cent of normal.

Why the intestines are the most vulnerable in shock is probably due to their normal physiologic role in the maintenance of arterial pressure. As a result of sympathetic impulses and pressor amines the portal system constricts to maintain arterial pressure, and in shock the excessive sympathetic stimulation and enormous outpouring of catecholamines constricts them further in an often vain attempt to sustain the falling pressure. As the blood flow in the intestines is increasingly shut off, a stage is finally reached in which necrosis of the intestinal mucosa occurs and this is the lethal factor in shock.[4] At this stage shock has become irreversible. It is an interesting circumstance that whether the shock is produced by occlusion of the mesenteric artery, or by hemorrhage, or by injection of epinephrin or endotoxin, there is an identical decrease of intestinal blood flow and the pathologic findings and mortality rates of the dogs were also identical.[4]

If the animals are pretreated before the shock is experimentally induced, then they can be rendered either shock-resistant, or shock-prone. They become shock resistant if given dibenzyline which antagonizes the action of the catecholamines which are in such excessive concentrations in the blood once shock is produced. On the other hand they become shock-prone if given epinephrin or nor-epinephrine which further reduces flow through the intestines. Although such pretreatment knowledge provides much useful information by strongly supporting the thesis of the intestinal viability as being the central feature in shock, application of such knowledge in the clinical situation is difficult after shock has already taken place and has existed for some time prior to the onset of treatment. Obviously no therapy can be expected to succeed once necrosis of the intestinal mucosa has already taken place. Consequently any therapy, even if it is physiologically based will fail at this stage. But since at the moment we do not have a reliable test for the existence of this irreversible state, therapy must be undertaken in all cases.

If, as is thought, irreversible shock is intimately related to decreased visceral blood flow resulting from severe visceral vaso-constriction and decreased plasma volume, then a logical approach to treatment should involve correction of these defects by the use of (a) adrenergic blocking agents combined with (b) fluid therapy. What seems unphysiologic is to employ vaso-pressor agents of which there is already an excess in such animals, and which could only further aggravate the constriction of vessels in the viscera thereby further compromising visceral blood flow. Such therapy would be expected to promote, even as it does in pretreatment for shock, the lethal factor in shock. Longerbeam *et al*[4] point out that to effectively save the lives of their dogs in shock, both adrenergic blocking agents and replacement of plasma volume are necessary. Dibenzylene 1 mg. per Kg, alone, caused a precipitous drop in blood pressure when given to a dog already in shock and most animals with it died in acute respiratory failure. However, when dibenzylene 1 mg. per Kg. was combined with 50-75 ml. per Kg. of plasma then, both the animals blood pressure and visceral hemodynamics improved remarkably and these animals survived a form of shock which was otherwise lethal in 95 per cent of untreated animals.

The pathological changes of irreversible shock are not necessarily the same for man as it is for the dog. It may be the dog intestine is peculiarly vulnerable because of a special kind of circulation to its intestine or heightened metabolism. But while the sensitivity of the various viscera in different species of mammals may vary, the basic disturbances of the visceral changes of shock seem to be identical for all species. It may merely be that the time it takes for irreversibility to occur is different, in different species. Therefore the best hope for effective treatment of lethal or irreversible shock at this stage of our knowledge would appear to lie in the attempt to restore normal hemodynamic mechanisms. This evidently involves relief of the intense vaso-constriction by employing adrenergic blocking agents, but in addition adequate replacement of plasma and red blood cell volume. In this way the common denominator of lethal shock, the mechanical limitation of blood flow to the intestines would be overcome and the various visceral changes responsible for the irreversible state ameliorated or prevented altogether.

We are all aware of the extremely poor clinical results obtained in patients suffering from septicemic shock due to gram negative bacteria, when using conventional methods of treatment with vaso-pressor agents. The dramatic successes Longerbeam *et al*[4] report by their method described above suggests that a trial of this alternative method of treatment is long overdue. We should await eagerly the results of the application of Longerbeam's method to the clinical situation.

L.H.N.

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Mannitol And Transfusion Reactions

Mannitol is rapidly earning recognition as a valuable diuretic material. Its toxicity is minimal and it is excreted in the urine almost quantitatively, pulling water with it. By maintaining a vigorous urine flow it is capable of preventing the renal shutdown which commonly follows incompatible transfusion reaction. Such reactions are most dangerous during surgery when the usual symptoms of chest and back pain, and the usual signs of fever and chills are masked by anesthesia.

Barry and Crosby[1] report a patient receiving 5800 ml of blood during surgery for removal of an abdominal aortic aneurysm who developed pink serum and urine under anesthesia. Immediate diuresis was started by infusing 100 Gm of mannitol as a 20 per cent solution over a 90 minute period, and the patient put out over 500 ml of urine per hour. Further use was made of mannitol as needed during the next few days and renal failure did not develop.

They recommend for any transfusion reaction involving fever, hypotension, hemoglobinuria or heart failure, the prompt use of 20 Gm of mannitol as a 20 per cent solution over a five minute interval. Fluids are pushed by mouth or parenterally and a urine flow of at least 100 ml/hour maintained; mannitol is repeated if urine flow falls appreciably. If oliguria is already present when the patient is first seen after a transfusion reaction, 20 Gm of mannitol is also given and measurements of urine flow started. If urine flow of 40 ml/hour or more can be maintained for the next two hours, push fluids and repeat mannitol as needed; do not give over 100 Gm/24 hours to patients who cannot excrete 100 ml of urine per hour. If the patient does not respond to the first dose of mannitol he already has lower nephron nephrosis and is treated accordingly with the usual low fluid regimen.

Although renal injury is a rare complication of transfusion it does occur and requires discerning therapy. Mannitol is a valuable addition to this therapy.

R.N.B.

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New Concepts Regarding Viruses

Within recent years, the science of virology has burgeoned by leaps and bounds. One of the remarkable findings has been the discovery of the role which nucleic acids play in the development of the virus cycle and their actual capacity to infect. This property places viruses in a special category of infectious agents, special in that they are not complete in themselves at all stages. Thus it is fair to say that the virus is not always a living organism, but rather a chemical substance which only becomes complete as a living entity when it is in the cell deriving substance from it. Recent investigations have revealed that the so-called business part of the virus has been identified and associated in great detail with nucleic acids particularly desoxyribonucleic acid (D.N.A.) or its analog ribonucleic acid (R.N.A.). These nucleic acids of the virus when incorporated into cells, modify them to the extent that a given cell can support for time a "virus" which is rapidly reproducing itself at the expense of the cells. Traditionally, this results in the early death of the cell, and that type of acute infectious process was first associated with the intra-cellular action of viruses. However, it appears now that these agents may exert themselves within whole cells in quite a different way and according to an arrangement in which the virus does not take the cell over or dominate it, so to speak, by producing so much virus that the process leads to cellular destruction, but one in which virus and cell are intimately combined for prolonged periods. Thus according to the second arrangement, instead of multiplying endlessly, the virus divides no faster than the cell divides. Indeed certain bacterial cells when infected with viruses can maintain the viral infection indefinitely; although under certain stimuli, this arrangement is disturbed to the point that the bacterial cell becomes so modified, that the more familiar form of actual viral infection takes place,—the cell is destroyed and the virus pours out in large quantities. For an appreciation of this point of view, it is necessary to realize that viruses, besides acting as parasites, can combine with and modify cellular nucleic acid and even in some instances, the hereditary nature of supporting cells. This is a concept with which the so-called cancer virologists have been much concerned. It can hardly fail to interest many others because it has upset older theories including the traditional distinction between heredity and environment.

As nucleic acids have long attracted the attention of biochemists, they are in a strong position to cope with these new concepts and they are indicating lines along which our thinking might well be directed. For instance, Sir Alexander Todd, Professor of Organic Chemistry at Cambridge University, England, has reviewed these new concepts quite succinctly, and even indicated the new lines of chemotherapeutic attack on virus disease which the future might hold.[1] Carrying these thoughts further, Herriot,[2] Professor of Biochemistry at the Johns Hopkins School of Medicine, has reminded us that free infectious nucleic acids are nonantigenic, and not affected by anti-sera which neutralizes the whole virus. This capacity of nucleic acids to breech the main defense mechanisms of animals as we know them, has led to several speculations. One of these is the question as to whether the apparent invulnerability of infectious nucleic acids is due to an inert envelope which surrounds the virus, shields it from nuclease and yet is nonantigenic.

Another thought, proposed by Herriot along more clinical lines, is that herein might lie the explanation of the long period of viremia in human infectious hepatitis, a viremia which seems to persist in the presence of hypothetical antibodies. Could this phenomenon be due to the presence of an infective nucleic acid and not necessarily to a complete virus recoverable by usual methods? Thus, this author concludes that a review of these phenomena in the light of new findings may yield a wholly new dimension to the science of clinical virology calling for considerations involving quite a new and different set of mechanisms. Certainly such revolutionary hypotheses deserve the attention of all clinically minded virologists.

JOHN R. PAUL, M.D.

Rationale Of Enzymatic Thrombolysis

Thrombolysin is a mixture of streptokinase and plasmin and owes its entire fibrinolytic activity when injected intravenously or locally to its streptokinase content, because the antiplasmin content of human blood is sufficient to neutralize the plasmin in this preparation. If it is active primarily on the basis of its streptokinase content, then it must be used as a streptokinase preparation. It so happens that patients vary many fold on the basis of their antistreptokinase content because of previous infection with the streptococcus. As a result, one must do a predictive dose test on the plasma to determine that amount of streptokinase which must satisfy all the circulating antibodies and then maintain a free level of circulating streptokinase in order to induce an active thrombolytic state. Unless this is done there will be found a tremendous variation as to whether a patient will have a thrombolytic state or not. Since thrombolysin is a mixture, it should be standardized in terms of the individual content of their respective agents. This The Advisory Committee on Coagulation Products has just undertaken to do.[1]

We are still in the early phases of development of thrombolytic therapy and currently enthusiasm rather than solid information dominates this field. Before this therapy can be developed for further practical clinical use, the user must know something about the biochemical state to be induced in the patient and how long it is to be maintained. We are not yet secure as regards the laboratory controls which must be used for regulating this induced biochemical state. We must have clear ideas of the hazards of the agents used and of the thrombolytic state induced. Once this information is available we still are not clear about the indications and contraindications of such therapy. The contraindications are derived from our knowledge of pyrogenic reactions which will be produced by these agents and also by hypotensive episodes. These may be more serious especially in patients critically ill with myocardial or cerebral infarcts, than the total benefit which may be derived from such therapy.

It is elementary to recall that the reason our blood remains fluid in our vessels is that the factors of thrombosis are inhibited. This implies that even if microthrombi were to form they would be dissolved by an inherent thrombolytic activity which is demonstrable in all of us but it is of a low order. However, thrombolytic activity increases in patients with hemotological malignancies, liver disease and acute infections. In fact, thrombolytic activity is far from static and can be readily enhanced by certain stimuli such as electroshock, injection of a pyrogen, of nicotinic acid and also after local ischemia. In fact, the suggestion has been made that in intermittent cerebal ischemic attacks, thrombi form which are dissolved spontaneously by local fibrinolytic mechanisms.[2] If locally released activator from the endothelium or connective tissue were to vary from one individual to another, could this be the reason for the spontaneous dissolution of certain thrombi and not others?

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Ischemia provoked by a thrombus is a potent local stimulus for increased fibrin dissolution.

What is obviously needed is a simple laboratory test which can tell us when intravascular thrombosis is occurring at inapparent sites. If we had such a test it would eliminate speculation about their occurrence. If they didn't occur we would not need to subject a person to procedures that have inherent morbidity of their own. This is especially important in cases of myocardial infarction without thrombosis and in all arterial closures where subintimal hemorrhage rather than a thrombus is the cause. If a thrombus is really the cause then simple methods by the use of drugs or ischemic procedures might be sufficient to dissolve the thrombus. It is obvious that there is a lot of basic work which must be solved before setting up a therapeutic trial especially with substances of uncertain potencies. Empirical observations at this point in the development of this form of therapy will not advance it nor put it on a firm foundation.

Unfortunately, no form of thrombolytic therapy has as yet satisfied completely the basic pharmacologic considerations, a knowledge of which should precede the use of enzymes in clinical medicine, nor have the indications for employing enzymes for thrombolytic purposes been made clear. For this reason the field should remain for the present at the level of clinical investigation.

L.H.N.

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Appraising The Appraiser

By excluding subjective bias, the double-blind test has made therapeutic research scientific and few drugs can be confirmed to be of value without the double-blind test. The principle of the double-blind test is a familiar one. During the research, neither the patient nor his physician knows whether the allegedly active drug, a placebo or a known standard drug for comparison is being given. In this way the physician's attitude can be isolated so that it will not influence his judgment. If the patient should improve, it will not be ascribed to the drug when in fact it is actually a non-pharmacologic effect. In this way the double-blind test has become the only scientific device specifically developed for the clinical investigation of drugs.

It should be remembered that the double-blind test eliminates subjective bias only from the data of a single experiment. It is in the process of assembling all the data together and communicating the results to fellow scientists that there can arise a source of confusion and actually does. For investigators are human beings with certain attitudes which are stable factors operating throughout the career of the investigator. If his attitude is one of enthusiasm, it is possible to bias his appraisal in favor of a drug. If his attitude is one of doubt, indifference or condemnation, then the data could appear unfavorable to him. We all realize that the appraiser must be reasonably disinterested in the particular direction in which the study points, but we know also that all people including the investigator are subject to unconscious forces producing emotional attitudes that the person himself is not aware of. And so the problem arises how it is possible to discern from scientific publications the existence of subjective bias.

Physicians may speculate about unconscious forces based upon what people tell them and what they see these people do when a physician reads a scientific report by a scientist who is unknown to him. He is not able in the conventional way to discount subjective bias on the part of the investigator. Only other scientists who know the writer and understand his attitudes might discern a subjective bias. Investigators come to expect a particular approach from an activity producing member of the same group and usually compensate for that approach when reading his reports. This is largely unavailable to the practicing doctor because he is separated from academic centers although he is the main consumer of clinical pharmacologic literature. An article on clinical pharmacology transmits data, it is true but its readers are less interested in data than in the question of whether the drug they are reading about will be useful in their medical practice. Can it be that the answer they get is really the attitude of the clinical pharmacologist?

If stable subjective bias influences the writings of clinical pharmacologists it should be possible to distinguish its extent. Greiner[1] has analyzed the writings of two investigators approximately of the same age and experience. The feeling generated in Greiner by reading the reports was ranked on a scale of enthusiasm: enthusiastic, favorable, indifferent, unfavorable condemnatory. A, published reports on eighty-three drug preparations on human subjects; and B 73. A appeared somewhat enthusiastic and seemed to approve over one-half of the drug preparations. B was largely indifferent or unfavorable and would seem to encourage the marketing of just under one-fifth of the preparations he tested. Both were competent investigators and when they worked with the same drugs (in nine instances), the data was compatible but the attitudes expressed and hence the reaction that the readers will have were very different. It seems as if subjective bias plays an important role in the writing of research papers as well as in the collection of data.

Greiner believes that both A and B unconsciously tailored their reports to meet their subjective bias. To him A was a "nice guy." He had a compulsive need to please people and it was possible to guess that his own self-esteem is simply a reflection of the peoples approval. B made many obvious attempts to be scrupulously fair but it was easy to sense hostility behind the work. "Perhaps B has the typical unconscious structure of the critic with bitterness and anger over unfortunate experiences of early life remaining as diffuse hostility." Whatever destructive urges which are continuously aroused are channelled into a socially acceptable form—the "critic."

While there are any number of interesting unconscious feelings that can influence us, there appear to be two common distortions which could unconsciously be introduced into scientific work, arising from the irrational and arbitrary forces of the unconscious concerning authority. An investigator with rebellious strivings towards authority might emphasize any data that would contradict the conclusions of the recognized experts. Others who have to repress their rebellious feelings, tend to confirm in their reports the opinion of these experts.

It appears that since scientific endeavor is carried out by human beings, their strengths and their weaknesses will be reflected in their scientific work. How then appraise the appraiser? Greiner thinks this can be done by choosing both a "nice guy" and a critic to work side by side to evaluate each new drug by the double-blind test. All of us thought the double-blind test solved everything. Now we know that the attitude of the appraiser can also be important.

L.H.N.

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John Crown's Legacy

[In 1946 a letter was published in The New York Times *from a young veteran in Halloran Hospital, a letter created by suffering, anguish and bewilderment. In 1950, after four years of struggling, the writer, John Crown, died.*

His legacy to the world was an example of courage and philosophy of life that, in these troubled and uncertain days, plead even more eloquently for the necessity of understanding than the day on which his letter was written.

In this era of precocious technology, hydrogen bombs, guided missiles and all the additions to the horrors of war that have caused an epidemic of anxiety and tension, throughout the world, this pain-racked boy's prescription for peace among men merits thoughtful re-reading during these Holy Days.]

My name is John Crown. I am a paraplegic at Halloran General Hospital. My physical wounds are very small in comparison with my spiritual wounds. I have come back from death to a world that I no longer care for. I, who have been engaged in the great struggle to save the world from tyranny and having seen my comrades die for this cause, can now find no peace in the world or in my country.

Having lived close to death for two years, the reasons why there is no peace seem infinitesimally flimsy. Russia wants the Dardenelles, Yugoslavia wants Trieste, the Moslems want India, labor wants more wages, capital wants more profit, Smith wants to pass the car in front of him, Junior wants more spending money. To these, I say, is it necessary to kill and cripple human beings for these petty gains?

Anyone who thinks a human body is so cheap that it can be traded for a tract of land, a piece of silver or a few minutes of time should be forced to listen to the moans of the dying, night and day, for the rest of his life.

All the troubles of the world originate in the common man. The selfish and greedy ways of nations are just the ways of each individual man multiplied a hundredfold. When the morals of the common man drop, so do the morals of the nation and of the world.

As long as our individual morals remain at low ebbs, so will be the world. Until each of us stops "hogging the road" with his car, stops fighting over the seat on the bus, stops aruging over who is going to cut the grass, there will be no peace in the world. If man wishes peace again, he must return to the Great Commandment, "Love thy neighbor as thyself for the love of God."

By Howard A. Rusk, M.D.; reprinted with permission of The New York Times.

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Director of Public Relations

Josephine P. Lindquist
Assistant to General Manager

COUNCIL MINUTES

Thursday, March 21, 1963

I. Attendance

Present in addition to Dr. Gilman, the Chairman, were: Drs. Deming, Pitock, Goldberg, Hess, Weise, Sr., Cullen, Gardner, Scully, Wilson, O'Connor, Grendon, Grant, Davis, Murray, Jr., Hughes, Weber, Martin, White, Abbot, H. Caplan, Phillips. Also present: Mrs. Lindquist Dr. Richards, Mr. Burch. Absent were: Drs. Bradley, Cornwell, Chartier, Dean, Gevalt, Egan, Hastings, Beardsley.

II. Routine Business

Approval Of Minutes

It was VOTED to approve the minutes of the meeting of Wednesday, February 20, 1963, as printed and distributed.

Life Membership

It was VOTED to approve applications for Life Membership for eligible Active Members as follows: Charles H. Audet, Sr., Fort Lauderdale, Florida (NH); Richard C. Buckley, Hartford (H); Stephen P. Donnelly, New Britain (H); Victor L. Farland, Hartford (H); Myron M. Radom, Hartford (H); Ralph A. Richardson, Bristol (H); Francis Brewer, Kentucky (H); Leopold A. St. John, Hartford (H); Ralph W. Storrs, W. Hartford (H); Richard C. Whiting, W. Hartford (H); Lee J. Whittles, Glastonbury (H); Sidney L. Biehn, Fairfield (F); John F. McGrath, Hartford (H); James E. Carroll, Hartford (H).

Exemption From Dues

It was VOTED to exempt Active Members from payment of *1962* dues as follows:

Edward J. Gerety, New Mexico (FCMA)
Joseph G. Hennessey, Bridgeport
Robert C. Parahoo, Glenbrook
Ralph L. White, New Canaan

Non-Resident Members

It was VOTED to refer to the Subcommittee to Study and Revise the Bylaws the question of providing for special dues consideration for members of the Society who wish to maintain an out-of-state (non-resident) membership status, particularly for the purpose of continuing various insurance programs available only to members of the Society.

Committee On AMA-ERF

It was VOTED to accept the resignation of Peyton H. Mead, Hartford, as Chairman of this Committee, and it was further VOTED to appoint Mead J. Luby, Hartford, to serve as Chairman for the remainder of the year 1962-63.

National AMA Legislative Conference

It was VOTED to direct the Chairman, the Chairman of the Committee on National Legislation and the General Manager to select three members of the Society to act as representatives at the AMA Legislative Conference to be held in Chicago on April 20-21, 1963. The AMA will defray the expenses of the three representatives who attend.

Date Of Next Meeting

The date of the next meeting will be Wednesday, April 17, 1963.

III. Old, New And Special Business

Society-Sponsored FM Radio Programs

Having received the report of the Division on Public Relations (presented by Luca E. H. Celentano, Chairman) and listened to sample tapes of "Doctor's House Call" (presented by Mr. Ted Hart of WBMI-FM, Meriden), it was VOTED to approve "putting on a series of Society-sponsored radio programs through WBMI-FM for 52 weeks, under the conditions specified and recommended by the Divisional Board on Public Relations." This vote of approval carries with it authorization to spend up to $2,344.00 of the Contingency Funds for 1963.

Censorship Questions

Having received two appeals for review by the Council of disciplinary actions taken by component county associations, one from a physician and one from a non-physician, it was VOTED to elect a Standing Committee (of the Council) on Preliminary Study of Censorship Questions as follows:

FCMA—Ellwood C. Weise, Sr.
HCMA—Stevens J. Martin
LCMA—David A. Grendon
NHCMA—Clyde L. Deming

NLCMA—Nicholas T. Phillips
MCMA—Richard F. Grant
TCMS—David S. Hastings
WCMA—Frederick A. Beardsley

Following election of the Committee, it was VOTED to appoint Ellwood C. Weise, Sr., as chairman. It was agreed that a member of the Committee from the component county association of which the physician concerned in an appeal was also a member should disqualify himself from participating in the review of that specific instance of appeal.

The new-elected Committee on Preliminary Study of Censorship Questions was then given assignments as follows:

(a) To receive and review the appeal filed by a Hartford County member from a disciplinary ruling of the Board of Directors of the Hartford County Medical Association.

(b) At the direction of the Chairman, to investigate, review and report to the Council concerning an appeal filed by a non-physician from a disciplinary ruling of the Board of Censors of the Fairfield County Medical Association.

Concerning the "finality" of censorship decisions of the Council, there appeared to be agreement that the Society's Bylaws provide that such decisions of the Council (1) supersedes rulings of the component county medical associations, if in conflict, and (2) could not be appealed to the American Medical Association.

Communication—Commissioner Of Health

Acting on a request from Franklin M. Foote, State Commissioner of Health, it was VOTED to appoint three or more general officers of the Society and the General Manager to meet with Dr. Foote to discuss with him the desirability, functions, utilization, etc. of an Advisory Committee being appointed by the Society to assist the Commissioner on matters relating to organizational problems of hospital staffs or services.

The Chairman designated the representatives to meet with Dr. Foote as follows:

Michael R. Scully, Bridgeport
James R. Cullen, Hartford
Norman H. Gardner, East Hampton
William R. Richards, New Haven

The Committee on Hospitals recommended that the discussion outlined above be conducted between Commissioner Foote and representatives of the Council.

Connecticut Medical Service, Inc.

It was VOTED to adopt a motion which reads as follows:

IT IS MOVED: That, on behalf of the Council, the General Manager transmit to the Secretary of CMS, Inc. three nominees for election by the Corporators as Directors of CMS, Inc. as follows: To replace Frank L. Polito, M.D. (resigned—Jachin B. Davis, M.D.; To replace Israel E. Blodinger, M.D. (incumbent)—Max Caplan, M.D.; To replace Frank H. D'Andrea, M.D. (incumbent)—Howard K. Ente, M.D. and convey to the CMS Corporators the opinion of the Council that these three nominees are well qualified to serve as CMS Directors on the basis of their professional competence, professional standing and familiarity with medical economics and matters relating to CMS, Inc.

As a further action, it was VOTED to request the Board of Directors of CMS, Inc. to present to the Council, in writing, a reasonably detailed outline of all current objectives of the Board which relate to the present and future operation of the Plan.

Report Of Committee On Preliminary Study Of Nominations

Reporting for the Committee, Dr. Deming presented a full slate of nominations for 1963-64. With one or two amendments among the membership of several committees, it was VOTED to accept the report of the Committee on Preliminary Study of Nominations for transmittal to the House of Delegates. Since the Council is the Nominating Committee of the Society, the slate accepted becomes the official slate to be presented by the Council.

Committee On Emergency Medical Service

(a) It was VOTED to accept, with commendation, a report filed by John Shoukimas, Chairman of the Committee, on his attendance at a regional workshop in Atlanta, Georgia, on February 3-4, 1963. The workshop was sponsored and put on by the Committee on Disaster Medical Care of the Council on National Security of the American Medical Association.

(b) Notice was made that the Committee on Emergency Medical Service is the only Standing Committee appointed by the Council which is not listed in the Bylaws. It was VOTED to refer inclusion of this Committee on the Bylaws, with a description of its composition and duties, to the Council's Subcommittee to Study and Revise the Bylaws.

Advisors—Connecticut Association Of Medical Assistants

At the request of CAMA, it was VOTED to appoint "advisors" to the Medical Assistants Association (sponsored by the Society) for 1963 as follows:

Morris P. Pitock, President-Elect (President 4/30/63)
William R. Richards, General Manager

Reports—Committee On Hospitals

(a) Re-Submission of Report on Survey of Hospitals in Connecticut concerning House Staff Remuneration and the Cost of Financing House Staff Education: Having conferred with representatives of the Council concerning two of the seven recommendations contained in the original Report, and having reviewed all pertinent opinions, the Committee on Hospitals re-submitted its Report for Council approval.

It was VOTED, in separate actions, to approve "new" recommendations Nos. 3 and 4 as submitted by the Committee. As amended and finally approved, the seven recommendations of the Committee on Hospitals on the subject read as follows:

1. Each hospital and medical staff actively pursue a continuing program for improvement of the educational aspects of its house-staff training.
2. The CSMS continue actively its liaison work with the Council on Medical Education and Hospitals of the AMA, in order to effect a more equitable distribution of available house staff.
3. Each hospital board and medical staff *consider the advisability* of jointly examining and defining their proper areas of responsibility for the development of methods to accomplish the objective of lessening economic pressures on the house staff, including, if possible, a definition of their mutual objective in the matter of what constitutes "a living wage" for house staff personnel in training.
4. Each hospital board and medical staff *consider the advisability* of jointly inviting the local community to share with them the responsibility of furthering the education of house staff personnel, possibly through the mechanism of providing voluntary financial assistance.
5. This survey report is to be sent to all hospitals and Chiefs of Staff in the State of Connecticut for use as a guide in solving local problems.
6. This survey report, with its recommendations, be published in CONNECTICUT MEDICINE.
7. A copy of this survey report and recommendations be sent to members of the Education and Hospitals Division.

(b) Report on Study of Board of Trustees-Medical Staff "Problems" at Johnson Memorial Hospital, Stafford Springs, Connecticut: Having received a comprehensive report from the Committee on Hospitals on its efforts toward studying the matters assigned to it, the Council VOTED to accept the Committee's report and the following "Conclusions":

1. The Committee on Hospitals feels that the original "difficulties" which arose between the Medical Staff and the administration at Johnson Memorial Hospital have been largely, if not completely, resolved.
2. The committee feels that several of the recommendations of the "Consultation Committee," appointed by the Board of Trustees, have been carried out with beneficial effect toward resolving these "difficulties." This opinion does not, in any way, constitute an endorsement by the Committee on Hospitals of the entire report of the "consultation" group.
3. The committee feels that such difficulties as may remain to be resolved, are of a somewhat different and less critical nature than those originally assigned to the committee for study. On this account, it is the committee's judgment that at the present time, to conduct a study of possible remaining areas of conflict between the Medical Staff and the Hospital Board at Johnson Memorial would be inadvisable.
4. The committee recognizes that the collective reputation of the Staff physicians may have been injured by the prolonged public controversy which surrounded this disagreement in Stafford Springs on matters of medical and hospital policy at Johnson Memorial. It therefore recommends that the Society offer, in any ways possible, to assist the Medical Staff in developing and implementing a local public relations program designed to enhance the confidence of the community in its physicians as leaders in the promoting and providing of the highest quality of medical care, both in the hospital and outside the hospital.

(c) Report on Statewide Hospital Planning: It was VOTED to accept this report from the Committee on Hospitals as information. The report indicated that the Committee has made initial steps toward "joining with" the Connecticut Hospital Association in studying matters relating to the need, desirability, format, etc. of establishing a voluntary agency to engage in statewide hospital planning.

Report Of Subcommittee To Study And Revise The Bylaws

Having received parts of a verbal report of the Subcommittee on several matters referred to it for study by the Council, it was VOTED to table action on the reports filed and to request the Chairman of the Subcommittee to submit a written report to the General Manager for the purpose of having it mimeographed and distributed to Council members prior to the next meeting.

Committee On Corporate Practice Of Medicine

(a) It was VOTED to accept the resignation of Jachin B. Davis, New Haven, as Chairman of the Committee, and it was further VOTED to appoint David A. Grendon, Sharon, to serve as Chairman. Both Dr. Davis and Dr. Grendon are members of the Committee.

(b) There being no formal report of the Committee at this meeting, the General Manager was instructed to turn over several pertinent documents on the subject of the corporate practice of medicine to the new Chairman, Dr. Grendon.

N.B.: *The foregoing is a summary of the proceedings and actions of the Council on March 21, 1963. Detailed minutes of the meeting are on file at 160 St. Ronan Street, New Haven, for perusal by any interested member of the Society.*

Membership Report Of The Secretary

FAIRFIELD COUNTY

Membership—January 1, 1962			894
New Members		40	
Less: Deaths	10		
Resignations, transfers	11		
Non-payment dues, etc.	8	29	
Net Gain		11	
Membership—December 31, 1962			905

HARTFORD COUNTY

Membership—January 1, 1962			1031
New Members		54	
Less: Deaths	13		
Resignations, transfers	16		
Non-payment dues, etc.	9	38	
Net Gain		16	
Membership—December 31, 1962			1047

LITCHFIELD COUNTY

Membership—January 1, 1962			135
New Members		4	
Less: Deaths	4		
Resignations, transfers	0		
Non-payment dues, etc.	0	4	
Net Gain		0	
Membership—December 31, 1962			135

MIDDLESEX COUNTY

Membership—January 1, 1962			126
New Members		2	
Less: Deaths	1		
Resignations, transfers	5		
Non-payment dues, etc.	2	8	
Net Loss		6	
Membership—December 31, 1962			120

NEW HAVEN COUNTY

Membership—January 1, 1962			923
New Members		44	
Less: Deaths	15		
Resignations, transfers	9		
Non-payment dues, etc.	2	26	
Net Gain		18	
Membership—December 31, 1962			941

NEW LONDON COUNTY

Membership—January 1, 1962			180
New Members		14	
Less: Deaths	2		
Resignations, transfers	2		
Non-payment dues, etc.	1	5	
Net Gain		9	
Membership—December 31, 1962			189

TOLLAND COUNTY

Membership—January 1, 1962			23
New Members		0	
Less: Deaths	0		
Resignations, transfers	1		
Non-payment dues, etc.	0	1	
Net Loss		1	
Membership—December 31, 1962			22

WINDHAM COUNTY

Membership—January 1, 1962			66
New Members		3	
Less: Deaths	1		
Resignations, transfers	3		
Non-payment dues, etc.	0	4	
Net Loss		1	
Membership—December 31, 1962			65

Associate Members	11	
New Members	0	
Less Deaths	0	
Associate Members	11	December 31, 1962

Total Society Membership—January 1, 1962			3378
New Members			161
Total Membership—December 31, 1962			3539
Less: Deaths	46		
Resignations, transfers	47		
Non-payment dues, etc.	22		115
Total Society Membership—December 31, 1962			3424
Net Gain for Year		46	

TOTALS

Fairfield	905
Hartford	1047
Litchfield	135
Middlesex	120
New Haven	941
New London	189
Tolland	22
Windham	65
	3424
Associate Members	11
	3435

Clinical Medicine

The Clinical Use Of The Carotid Sinus Reflex

Louis H. Nahum, M.D.
New Haven

In 1845, the brothers Weber electrified the audience at the International Congress of Physiology in Rome by showing that stimulation of the vagus nerve in a frog caused complete cardiac arrest. Some twenty years later Czermack[1] massaged a bulbous swelling in his left neck at the level of the upper margin of the sternocleidomastoid muscle and experienced faintness and temporary bradycardia. In the light of the Webers observation, Czermack attributed the bradycardia to mechanical stimulation of the adjoining vagus trunk by pressure to the carotid bulb. However, it was not long before Concato[2] showed that bradycardia occurred only if the pressure was applied at the bifurcation of the common carotid, whereas pressure on the cervical vagus alone was without such effect.

Hering[3] established finally the reflex nature of the carotid sinus stimulation. He separated the vagus nerve from the adjoining vessels and found as did Concato a half century earlier, that mechanical pressure upon the bifurcation of the common carotid artery alone continued to produce the same degree of bradycardia. He found further that the bifurcation was richly supplied with sensory nerves which emerge from the adventitia as spiral fibers to form the sinus nerve of Hering which joins the glossopharyngeal nerve. Thus a direct apparent nerve connection was shown to exist between the carotid sinus and the medullary centers. When the sinus nerve was divided or cocainized, then no reflex changes in the heart followed raising or lowering the pressure in the carotid artery. As a result of many studies, there emerged the physiologic significance of the carotid sinus as a part of the baroreceptor system of the body controlling heart rate and arterial pressure. Bradycardia hypotension and apnoea result when electrical stimulation is limited to the presso-receptor fibers of the nerve of Hering. A similar effect can be produced by mechanical stimulation of the carotid sinus by massage and or compression. These are reflex effects mediated through the vagus and inhibition of accelerator impulses to the heart from the stellate ganglion.

The sudden distention of the carotid sinus such as occurs in a quick rise in arterial pressure leads to initial slowing through vagal activity but gradually decreased sympathetic activtiy emerges as the major restraining influence. In addition there are also respiratory effects due to inhibition, bronchoconstriction and pulmonary hypotension—in other words massive inhibition of medullary centers. In the periphery there is pooling of blood due to venous dilation and a reduction in the cardiac output. The physiologic role then of the two carotid sinuses together with the presso-receptors in the aortic arch is to form a verified depressor system. These baroreceptors are stimulated by the systolic surges of intra-vascular pressures to emit inhibitory impulses that continuously restrain the cardio-accelerator and vaso-constrictor centers within the medulla.

In the normal person carotid sinus stimulation, aside from the respiratory effects which probably result from stimulation of the carotid body are identical with that caused by vagal stimulation. There is sino-atrial slowing, there is atrial conduction defects with changes in morphology of the P wave. Prolonged conduction time as revealed by lengthened P-R interval, occasional atrioventricular block with complete asystole, but after four to ten seconds, ventricular escape by ventricular ectopic beats. In the vast majority of cases, however, (75 per cent) only slowing occurs. In persons over forty years of age, the response is found in 82 per cent of cases, whereas, under forty it is found in only

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18 per cent. Clearly, as age advances, changes in the carotid sinus wall itself may affect the sensitivity of the baro-receptors. In 103 aged patients Mandelstamm[4] found the avereage fall in systolic pressure to be 37 mm Hg. Whereas in 106 healthy soldiers it was only 5 mm. Hg. The fall in arterial pressure lasted several minutes and outlasted the bradycardia. The basis for the fall in systemic pressure in man is probably vasodilatation in the splanchnic, renal, muscular and cutaneous arterial circulations. The reflex effects upon the heart and peripheral vessels are independent of each other although they generally occur together.

After it was realized that the carotid sinus exercises its effect upon the heart through reflex vagus nerve stimulation, the search began for clinical states in which utilization of vagus activity would be therapeutically useful.

Wasserman[5,6] was the first to observe that stimulation of the carotid sinus was effective in terminating some episodes of acute pulmonary edema especially those associated with hypertension and tachycardia. Clinical attention to the carotid sinus as an area responsible for syncopal attacks was highlighted by the excellent studies of Weiss and Baker.[7]

It was called the "carotid sinus syndrome" in which there is spontaneous occurrence of faintness or loss of consciousness that is reproducible by stimulation of the carotid sinus on either the right or left side, but not by pressure on the carotid artery below the sinus. They distinguished three types of mechanism underlying the syndrome, cardio-inhibitory in which there is prolonged ventricular asystole observed in 34 per cent of fifty-six patients, vasodepressor reflex causing generalized vasodilatation with fall in arterial pressure found in 5 per cent, and "cerebral" reflex due, as we shall see below, to interference with the cerebral circulation not prevented by atropine and not properly a part of the carotid sinus reflex. For a while after this, the carotid sinus was popularly employed to achieve vagel effects for clinical and therapeutic purposes but gradually the procedure fell into disuse largely because of a number of reports of the potenially harmful cerebral consequences of carotid artery obstruction rather than massage of the carotid sinus during the act of carotid sinus stimulation.

The superficial location in the neck of the carotid sinuses permits their ready manipulation, and makes it easy with proper technique to influence the heart and peripheral vessels. There are certain points of importance in the technique of stimulating the carotid sinus that need emphasis.[8] It seems best to have the patient recumbent in order to reduce the liklihood of syncope. An exception is the patient who is being tested for relief of anginal pain who usually is more comfortable in the sitting position. The head is tilted either forward or backward to one side or the other until the expansile carotid sinus is readily palpated. The neck muscles must not be taut or too slack, for either makes it difficult to feel the appropriate part of the vessel. The sinus is usually situated just below the angle of the jaw at the upper level of the thyroid cartilage. The carotid bulb is massaged with pressure directed posteriorly and medially, the artery and the sinus being compressed against the vertebral spine. Massage is applied for not more than five seconds at a time so that carotid blood flow is interrupted only transiently. After several seconds the procedure may be repeated, if vagal effects have not been obtained or have subsided prematurely.

The dangers of carotid sinus massage are believed to be due to faulty techniques, in which there occurs interference with the cerebral circulation. Askey[9] described seven patients who developed hemiplegia with a cerebral lesion on the same side as the carotid sinus that was supposed to be stimulated. Nevertheless, five of these patients had no cardiac slowing at all and therefore, no reflex. One is led to the conclusion that arrest of the carotid circulation from prolonged compression of this vessel probably injured a portion of the brain already vulnerable because of carotid artery insufficiency. On careful consideration it becomes evident that these complications were not an inherent part of the carotid sinus reflex but were in fact the consequence of prolonged compression of the carotid artery and mechanical interference with cerebral blood flow. If the maneuver of carotid sinus massage is gently done, for not longer than five seconds at a time, then cerebral effects are not encounterd. This reviewer who has employed this test over many years has encountered no serious complications, and Lown & Levine[8] in an experience of several thousand such tests have noted but one brief episode of facial weakness which cleared up in several minutes. In patients over seventy-five and in the presence of cerebral vascular disease the maneuver should be avoided since in such patients there is a hazard from sclerosed and narrowed cerebral vessels but also from an unduly sensitive reflex and a possible resultant prolonged asystole. This is especially prone to occur when a carotid sinus stimulation abolishes a paroxysm of rapid heart. In a patient with coronary artery disease or angina pectoris initial pressure should be brief and gentle and as soon as desired effect is obtained, the manipulation is stopped.

Greenwood and Dupler[10] have just reported two patients that died following carotid sinus stimulation. However, the first patient with staphylococcal pneumonia and supra ventricular tachycardia with A-V block, and large doses of digitalis had his carotid sinus massaged several times and finally died of his overwhelming infection and probably not because of reflex vagal effects upon the heart. The second patient had an acute posterior myocardial infarction developed a rate of 180 and died in asystole after four seconds of carotid sinus stimulation. The nature of the tachycardia was not established. It could well have been ventricular tachycardia which does not respond to reflex vagal inhibition and which at times terminates in ventricular fibrillation especially in acute myocardial infarction.

All in all, it can be stated therefore, that massage of the carotid sinus, when a few simple precautions are heeded, is a procedure devoid of serious hazard. It is the simplest and quickest way to utilize vagal influences upon the heart for diagnostic and therapeutic purposes.

The vagus can arrest the sino-atrial pacemaker, slow conduction through the atria, delay and even block impulses at the A-V node. Such effects can be achieved by carotid sinus massage and therefore, this procedure can become an effective tool whenever it is necessary to abolish atrial or nodal tachycardia and restore the heart to a normal mechanism. The experienced cardiologist often tries to slow up the heart to differentiate between slow regular sinus rhythm with bradycardia from complete A-V block or 2:1 AV block. By slowing up the heart he can distinguish slow regular sinus rhythm from a regular rate due to atrial flutter or atrial tachycardia with block. By slowing up the heart he can distinguish between tachycardias that are due to regular sinus rhythm from paroxysmal atrial tachycardia.

Vagus stimulation can relieve anginal pain. Wasserman in 1928[5] was the first to point out that carotid sinus massage can abolish an anginal attack. The diagnostic and therapeutic implications of Wasserman's observation have been ignored by clinicans. It has been dropped out of current textbooks on cardiology. Lown and Levine[8] in hundreds of patients have fully confirmed the value of carotid sinus stimulation in the diagnosis of angina pectoris. When a patient has chest pain, the physician should promptly listen to the heart. If an assistant holds the stethoscope in place, then both hands are free to perform the test. The patient is best in the sitting position in which coronary pain is less intense. If massage of the right carotid sinus does not produce slowing then the left side is tried. As soon as the heart slows the pain lets up or is all gone. Disappearance or lessening of the pain occurs almost instantly within seconds after the onset of slowing. Even if the heart accelerates, the pain does not recur. Chest pain that is relieved by cardiac slowing may safely be interpreted as angina pectoris. If no relief follows carotid sinus stimulation or the pain is made worse even though the heart is slowed, the discomfort is not anginal in nature, but it might still be due to myocardial infarction. Pain derived from gall bladder disease, hiatus hernia, cervical arthritis or various other chest conditions generally is not relieved by carotid sinus massage. At present in spite of the importance of the observation, the mechanism of relief of angina pectoris through reflex vagal stimulation is not clear.

Massage of the carotid sinus may relieve acute pulmonary edema in patients with hypertension, tachycardia and coronary artery disease. First noted by Wasserman[6] it has since been amply confirmed. The maneuver has been found effective in 80 per cent of patients. The relief is almost immediate and coincides with the onset of bradycardia. In the majority there is an associated drop in arterial pressure. Fear, dyspnoea, and chest oppression disappear. The patient can lie down flat. Perspiration lessens, pallor vanishes, pulmonary rates decrease, heart sounds which were augmented diminish in intensity and the apex impulse becomes less forceful. The maneuver does not seem to be effective in aortic valvular disease, nor in an arrhythmia like atrial fibrillation in which the slowing cannot be achieved by reflex stimulation of the vagus. The explanation for the dramatic relief may be readily understood if we recall that pulmonary edema begins with tachycardia, elevation of blood pressure, cutaneous vasoconstriction, and other sympathetic nervous system manifestations. Carotid sinus stimulation by slowing heart rate, lowering peripheral resistance reduces left ventricular pressure work and reverses the process that overburdened the left ventricle.

The close inter-relationship between the action of digitalis and the vagus has permitted the clinician much apportunity for careful clinical evaluations. Digitalis may sensitize the heart to carotid sinus stimulation, so that one can observe greater slowing, cardiac standstill or complex arrhythmias. As little as 0.2 gram digitalis leaf has been reported to produce increased carotid sinus sensitivity in man. The increased cardiac response that follows digitalization can be utilized in the treatment of supraventricular tachycardia, for if carotid sinus stimulation fails to terminate a paroxysm of atrial tachycardia it may do so if performed after digitalis administration. In fact, it may do so with a less than usual digitalizing dose.

Occasionally carotid sinus stimulation provides the earliest evidence of digitalis intoxication and clarifies hitherto unexplained symptoms. Lown and Levine[8] describe two patients, one who had periodic cardiac standstill which was reproduced by carotid sinus massage and which disappeared with cessation of digitalis administration. In another patient who was bedridden with intractable vertigo, massaging the carotid sinus caused an a-v conduction disturbance of the Wenkebach type. The symptoms promptly disappeared when it was discovered he was taking digitalis and it was discontinued.

If carotid sinus massage were employed more frequently during digitalization, then it can be discovered whether a patient is suffering from digitalis over dosage, in the absence of any objective evidence of such a disorder. One will discover those patients who may be having a low threshold to the toxic action of the glycoside and perhaps those with hypopotassemia. The heart failure patient who is digitalized and presents unexplained symptoms or signs should be studied by carotid sinus stimulation. Then it might be discovered that the bizarre picture is due to digitalis excess.

In summary, it can be stated that properly performed, carotid sinus stimulation is a safe, highly useful clinical procedure in paroxysmal atrial tachycardia, in angina pectoris in acute pulmonary edema, in digitalis toxicity, in establishing the cause of certain syncopal attacks and in clarifying some arrhythmias. It deserves more use in clinical medicine than it now receives.

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NOTES ON TOXEMIA OF PREGNANCY

Subcommittee on Toxemia of the Committee to Study Maternal Mortality and Morbidity

Clarence Davis, M.D.
Franklin H. Epstein, M.D.
New Haven

The Patient

The patient, an 18 year old, unmarried, primagravida, was admitted to the hospital in early labor.

Prenatal Course

She received no prenatal care. She had nausea and vomiting in the first trimester, and some ankle edema approximately 1 month before admission. She had no headaches or visual disturbances. The date of the last menstrual period was unknown.

Course in Hospital

The patient was admitted to the hospital at 10:45 p.m., having had two pains in the early afternoon, the membranes having ruptured 4 hours before admission. Blood pressure was 110/70, pulse 80, heart negative, lungs clear, no edema. Uterus was two-thirds of the way up to the umbilicus. No contractions were felt. Fetal heart was 120 in right lower quadrant. Rectal examination revealed the cervix to be effaced and 6 cm. dilated.

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DR. FRANKLIN H. EPSTEIN is Associate Professor of Internal Medicine, Yale University School of Medicine.

Shortly after admission patient began having mild but effective pains. At 2:20 a.m. patient's cervix was 8 cm. dilated. Nisentil ampules 1 and sodium luminal grains 2 were given at 2:25 a.m. Patient slept for a while, then began having regular pains with increasing frequency. The cervix was fully dilated at 7:00 a.m.

At 7:02 a.m. she delivered a male infant weighing 5 lbs. 3½ ounces, in fair condition. Uterus remained enlarged and vaginal examination at this time revealed bulging membranes with a footling twin. Membranes were ruptured and a second male infant was delivered by spontaneous breech at 7:05 a.m. which weighed 4 lbs. ½ ounce and was in critical condition at birth.

Five minutes following delivery of the second child, the placenta was delivered. Anesthesia for delivery consisted of local infiltration with Novocaine and whiffs of Ether.

The patient did well immediately postpartum. However, three hours after delivery, at 10:00 a.m., blood pressure was 140/80, at 12 noon 140/100, and at 1:00 p.m. 162/100. She seemed glassy eyed and lethargic, and complained of headache and dizziness. The face had a puffy appearance but no edema was demonstrable. She had not voided since admission but voided involuntarily at this time. She received morphine sulfate grains 1/6 subcutaneously and an infusion of 500 cc. of 10 per cent D/W followed by 500 cc. of 5 per cent D/W.

At 3:00 p.m., approximately 8 hours postpartum, a catherized urine showed 4 pus albumin, many red blood cells, and 2-4 pus cells/hpf. The urinary output was satisfactory. At 6:00 p.m. the blood pressure was 120/70 and the patient was feeling better. The temperature never rose above 99°F.

On the first day postpartum, the blood pressure was 142-128/90-80; the patient was comfortable, and urinary output, adequate. Blood chemistry: CO_2 21.1 mEq; N.P.N. 25 mgm. per cent, uric acid 2.2 mgm. per cent. Urine: specific gravity 1.011, 4 plus albumin; 10-12 RBC/hpf, 10-12 WBC/hpf. Blood: Hemoglobin 11 grams, R.B.C. 3.9 million, W.B.C. 11.4 thousand.

For the remainder of her hospital stay, patient's blood pressure ranged from 136/80 to 130/90 to 118/76. Approximately 9 days after delivery of twins, patient was discharged from the hospital.

Additional Laboratory Data

Approximately 5 days postpartum urine culture was plated. It was negative after 72 hours.

Urine: Clean Catch

	1st day P.P.	2nd day P.P.	4th day P.P.	8th day P.P.
Specific gravity	1.010	1.011	1.005	1.015
Albumin	4 plus	4 plus	3 plus	3 plus
W.B.C.	2-4/hpf	10-12/hpf	20-25/hpf	numerous
R.B.C.	loaded	10-12/hpf	——	numerous

Blood

	1st day P.P.	3rd day P.P.	6th day P.P.
R.B.C.	3.4 m.	3.2 m.	3.9 m.
Hemoglobin gms. per cent			
W.B.C.	11.4	——	11.4

Patient has not returned for a postpartum check-up.

Comment

This is an interesting illustration of a problem which is not rare: signs suggesting toxemia of pregnancy are detected for the first time *after* rather than *before* delivery. Occasionally, eclamptic convulsions appear following parturition, especially within the first 24 hours. In most such cases, however, either proteinuria or increased blood pressure have made their appearance *before* the placenta is delivered. When hypertension *without proteinuria* is seen for the first time postpartum, it is generally a reflection either of pre-existing high blood pressure which was temporarily lowered during pregnancy, or (in a surprisingly large number of cases) of intense emotional disturbance associated with the birth.

In the present case it is possible that proteinuria and perhaps hypertension would have been discovered if the patient had visited her physician earlier.

Several items suggest that this patient suffered from underlying renal disease unrelated to pre-eclampsia; for example, chronic glomerulonephritis. Proteinuria was massive and failed to clear under observation. Hematuria of this degree is not usual in toxemia of pregnancy, though it may have been caused here by repeated catheterizations. The serum uric acid was not elevated, suggesting that if the process was indeed pre-eclampsia, it was of extremely short duration.

The responsibility of the physician to exercise more than usual care in following such patients after delivery is apparent. One wonders whether the failure of this patient to return for any postpartum visits might be attributed to the fact she was not sufficiently apprised of the real importance of such follow-up examinations.

Fallout And Countermeasures

What should the physician tell the patient who asks about measures that might afford protection against nuclear fallout from test explosions? With some authorities seeing grave danger in fallout and others finding no cause for alarm, the patient's question is not easy to answer. In the material that follows, The Medical Letter has tried not only to set down answers that seem most reliable in the light of present knowledge, but also to provide background information that will help the physician appraise developments in a situation subject to rapid change.

Deposition of Fallout — Three types of radioactive fallout are recognized: local, tropospheric, and stratospheric.

1. Local fallout consists mainly of particles larger than 0.1 mm., usually deposited for about one day within several hundred miles of the explosion. Local fallout is greatest after surface or near-surface bursts, when the radioactive particles are carried by much larger particles of soil or other material in the fireball. Local fallout would be a major factor only in nuclear war.

2. Radioactive debris, injected into the troposphere (below 10,000 meters — about 6 miles) and carried around the world by tropospheric winds, contains particles smaller than 100 microns, and usually smaller than 10 microns. These particles are likely to remain air-borne for a month or more; their deposition is markedly affected by weather conditions.

3. Stratospheric fallout consists of debris smaller than 10 microns, injected above the troposphere (above 10,000 meters); generally it begins to be deposited after about a year and may continue to fall for several years.

Depending on how long they are air-borne, a variable fraction of the radio-nuclides (radioactive isotopes) will have decayed before they reach the ground. Thus, tropospheric fallout is the main source of short-lived radionuclides, and stratospheric fallout is the main source of long-lived radionuclides. The most important radionuclides present in fallout and their half-lives are: iodine 131 (8 days); niobium 95 (5 weeks); strontium 89 (8 weeks); zirconium 95 (9 weeks); strontium 90 (28 years); cesium 137 (30 years); and carbon 14 (5760 years).

The "half- residence time" in the stratosphere (time taken for half of the injected activity to be lost by deposition and decay) of the debris of a nuclear explosion increases with the energy and altitude of the explosion and is greater for explosions nearer the equator. Half-residence time may be as short as a few hours after an explosion under exceptional circumstances. Usually the time varies from several months for low-altitude explosions in temperate and polar latitudes, to a year or more for explosions at high altitudes. Deposition is greatest in the temperate latitudes; peak deposition usually occurs in the spring.

Reprinted from the Medical Letter on Drugs and Therapeutics.

PROVISION FOR MEDICAL CARE TO DEPENDENTS OF MEMBERS OF THE MILITARY FORCES OF NATO COUNTRIES

1. On and after 1 July 1963 the accompanying dependents of active duty military personnel, who are members of the land, sea and air forces of North Atlantic Treaty Organization countries stationed or passing through this country, will be entitled to the same care under the Medicare Program as those dependents of members of the uniformed services.

2. The standard Identification Form DD Form 1173 will be furnished to those dependents and all contractual provisions and criteria as to scope of care and eligibility will be the same as for dependents of members of our uniformed services.

3. In the coding of Appendix A, the branch of service code and grade of the NATO member will bear the same number as our corresponding branch of service code and grade. For purposes of identification of dependents of NATO members, programming, and budget actions by this office, place an "X" or "11" overpunch in column 17.

4. When NATO claims (DA Forms 1863) are transmitted to this office along with the routine submission of the voucher, claims, and cards should be segregated and earmarked.

5. This provision becomes effective 1 July 1963 and will be implemented by formal contract modification.

OBITUARIES

Jacob Nemoitin, M.D.

1880 - 1963

Dr. Jacob Nemoitin who died at his home on January 3, 1963, practiced medicine, surgery and obstetrics in Stamford since 1907. He was active professionally on the day prior to his death. Dr. Nemoitin was born in Bialo, Russia, in 1880, and came to America with his family in 1898. After further preparatory school work he matriculated at the College of Physicians and Surgeons, Columbia University, New York City, and graduated in 1905. He then interned at the Beth Israel Hospital in New York City and in 1907 assumed the practice of a Jewish doctor who had died in Stamford, Connecticut. He served Stamford well during all these years and his linguistic ability was of inestimable value especially during the early years of this century when there was mass immigration.

Dr. Nemoitin was a man of many parts; he was "the complete physician," dedicated to his patients and his profession; he was a linguist, a student of the Talmud, an expert photographer, and a very expressive painter of both landscapes and portraits.

It was his custom for many years to carry sketching pencil and paper with him wherever he went and often he could be seen sketching from life either on the wards or on the street. A touching story told of him is that during World War II, just after having pronounced one of his patients, an elderly woman, dead he sat down with tears in his eyes and proceeded to sketch her countenance. He turned to his medical colleague and said that he was trying to capture the beautiful look of serenity and peace that had come upon the face of this just expired patient, the wife of his colleague. Copies of this sketch he said he would send to the sons of this lady, one of whom was also a physician, and who was overseas, to give to them a glimpse of the expression of serenity that had possessed their mother's face.

Dr. Nemoitin had long since become a living legend in this community. When he first practiced he would make his rounds on bicycle, and later by horse and buggy, and then he moved on to the model T Ford and other cars. He will be remembered by the literally thousands of people whom he treated without remuneration. His practice was large and over the years he delivered thousands of babies, both at home and in the hospitals.

On January 22, 1955, Dr. Nemoitin was honored by a testimonial dinner given by the B'nai B'rith of Stamford, Connecticut. There was an overflowing crowd. Such testimonials were repeated on two other occasions, October 31, 1962 and November 28, 1962. On October 31st he was given a testimonial dinner by the Brotherhood of Congregation Agudath Sholom, and on November 28th, the Leisure Time Men's Club of Stamford honored him as the "Outstanding Senior Citizen of 1962." His personality was contagious, he loved all mankind, and he was beloved by all. He married the former Miss Frances Einhorn, whom he met while he was an intern and she a student nurse.

He is survived by his wife and by his son, Dr. Bernard Nemoitin, a senior attending surgeon at the Stamford Hospital and St. Joseph's Hospital in Stamford.

Dr. Nemoitin was a member of the Stamford, Fairfield County and Connecticut State Medical Societies and of the American Medical Association. He was on the honorary staff of the Stamford Hospital and on the consulting staff of St. Joseph's Hospital. As Rabbi Ehrenkranz said at the funeral, "If there were a psalmist today to capture the flavor of the life of Jacob Nemoitin he would utter the words, unto his patients he shineth as a light in the darkness, gracious and full of compassion and righteousness."

ARTHUR KOFFLER, M.D.

Francis Michael Burns, M.D.

1910 - 1963

Dr. Francis Michael Burns died at the Hospital of St. Raphael of a cerebral thrombosis on February 15, 1963 at the age of 52. He was born in Shelton, Connecticut on August 7, 1910, and was the son of the late Mr. and Mrs. George Burns and the brother of the late Dr. George Burns. He graduated from Shelton High School in 1929, received his B.S. degree from Fordham University in 1933, and his M.D. degree from the College of Physicians and Surgeons, Columbia University in 1938. He interned at the Jersey City Medical Center from June 1939 to March 1940. Dr. Burns began his practice in Shelton in 1940, where he continued to practice until his death. He resided at 37 Union Street, Shelton, Connecticut. He is survived by his wife, Mrs. Mildred Houlihan Burns, and by two daughters, Frances Marie Burns, a senior at St. Mary's High School, and Nancy Elin Burns, a student at St. Joseph's School in Shelton. He was a member of the staff of the Griffin Hospital in Derby; a member of the Naugatuck Valley Medical Association; the Fairfield County Medical Association; the Connecticut State Medical Society; and the Highland Golf Club of Shelton.

Edward J. Blumenthal, m.d.

In Memoriam

Bowen, Joseph, J., Jr.—Waterbury; University of Maryland, 1941. A major in the Medical Corp during World War II, Dr. Bowen was stationed in Africa and participated in the Anzio beachhead campaign in Italy. After the war, the doctor did graduate work at Yale Pathology Department of Yale Medical School for one year and studied at American Hospital and at Mercy Hospital for the following two years. Dr. Bowen opened his practice in Waterbury in 1949 and was attending internist at St. Mary's and Waterbury hospitals. He had been appointed medical examiner for Prospect last year and had served many times as acting medical examiner of Waterbury. He served as president of the Waterbury Area Heart Association since May 1961, having been a member of the association since 1949. He was also a member of the Board of Directors of the Connecticut Heart Association and was co-chairman of the 1963 Annual Meeting Committee of that organization. He was a member of both the Cancer Society and the Rheumatism and Arthritis Foundation of Waterbury. Dr. Bowen was an associate of the American College of Physicians and the American College of Chest Physicians. He was a member of the Waterbury Medical Association, the New Haven County Medical Association, the Connecticut State Medical Society, and the American Medical Association. Dr. Bowen was also a member of Lodge of Elks, the Waterbury Lions Club, the Country Club of Waterbury, and the Veterans of Foreign Wars. Bowen was a communicant of Christ Church. Dr. Bowen died March 24, at the age of 46.

Ghiselin, Alexander A.—Southbury; Columbia College of Physicians and Surgeons, 1929. Dr. Ghiselin was director of health, school physician, and a member of the Board of Education in Southbury. He was attending otolaryngologist at Waterbury Hospital, and was recently appointed a trustee of the Southbury Training School by Governor John Dempsey. Dr. Ghiselin had served two years as Democratic town chairman, but declined renomination last April. He was the first physician in recent years to maintain an office in Southbury. Before limiting his practice to the specialized field of ear, nose, and throat, he was instrumental in bringing two other doctors to Southbury. Dr. Ghiselin was a member of the Connecticut State Medical Society. He died March 17, at the age of 58.

Hale, Fraray—Fairfield College of Physicians and Surgeons, Columbia University, 1909. Dr. Hale was a descendent of Pioneer founders of Connecticut in Glastonbury and had an active practice of general medicine in Bridgeport for many years. Dr. Hale served on the draft examining boards in World War I and World War II. Dr. Hale was a member of the Fairfield County Medical Association, the Connecticut State Medical Society, and the American Medical Association. Dr. Hale was active in the former Greenfield Hill Golf Club and the Brooklawn Country Club. He died March 6, at the age of 80.

Poole, Allan K.—New Haven; Johns Hopkins Medical School, 1923. Dr. Poole, a specialist in internal medicine, served with the Army Medical Corps during World War I. Dr. Poole retired a year ago from the Yale University School of Medicine where he had served as an associate in clinical medicine for over 30 years. He was health officer of Orange for many years and at his death was attending physician and on the staff of Grace-New Haven Community Hospital. Dr. Poole was a member of the American Medical Association, the Connecticut State Medical Society, the New Haven County Medical Association, the Graduate Club, the Yale Faculty Club, Orange Post-American

Legion, two fishing clubs, the Walton Club of Cornwall and the Potatuck Club of Newtown, and the Orange Lodge 143, AF and AM. Dr. Poole died March 17, at the age of 67.

Tokarczyk, John J.—New Britain; University of Vermont, 1920. Dr. Tokarczyk was the medical examiner in New Britain for 14 years. He also served as an examining physician in driver sobriety tests at the police department. Dr. Tokarczyk was a member of the Connecticut State Medical Society, the Hartford County Medical Association, the New Britain Medical Society, the Polonaise Club, Holy Cross Church, and a number of local organizations in New Britain. Dr. Tokarczyk died March 16, at the age of 72.

PLACEMENT WANTED

The Society's Placement Service is in receipt of the following:

Leopold S. Kaplan, age 33—M.D. Hahnemann Medical College 1955. Specialty Radiology. Available June 1963.

L. Robert Rubin, age 29—M.D. State University of New York College of Medicine 1958. Specialty Pediatrics.

Winslow H. Arnold, age 33—M.D. New York University College of Medicine 1955. Specialty Internal Medicine or Institutional work.

J. J. Schwammbaum, age 33—M.D. Berne University, Switzerland 1958. Specialty General Surgery.

Wm. H. Jameison, age 34—M.D. Albany Medical College 1955. Specialty General Surgery.

Henry Grant, age 29—M.D. New York Medical College 1960. Specialty Otolargngoloty.

Surgeon: Young — Excellent university training. Awaiting orals for board certification. Desires good association in northeast.

Lon E. Curtis, age 31—M.D. Harvard Medical School. Specialty Surgery. Available June 1963.

1963 MEETINGS

May 15—Third Symposium on Graduate and Postgraduate Medical Education in the Community Hospitals to be held at the Yale-New Haven Medical Center, 1:30-5:30 P.M. Sponsored by the Connecticut State Medical Society, Connecticut Hospital Association and Yale School of Medicine.

June 16-20 — American Medical Association, Annual Meeting to be held in Atlantic City.

September 27—38th Connecticut Clinical Congress to be held at the Yale-New Haven Medical Center.

December 4—Annual Meeting of the Connecticut Society of American Board Surgeons, Inc.

1964 MEETINGS

June 14-19—The VII Interamerican Congress of Cardiology will be held in Montreal, Canada.

Effects Of Systemic Anticholinergic And Other Drugs On Glaucoma

Systemic parasympatholytic (antispasmodic or anticholinergic) drugs are often used as pre-anesthetic medication and for relief of Parkinsonism and some gastrointestinal disorders. The fear that these drugs will increase intraocular pressure and precipitate or aggravate glaucoma has, however, sometimes discouraged their use. With most patients this fear is unwarranted.

Hazardous Uses—A hazardous rise of intraocular pressure from the use of systemic anticholinergic drugs occurs only in patients with "narrow-angle" glaucoma and in some nonglaucomatous patients with an abnormally narrow angle of the anterior chamber. No significant rise occurs in eyes with a normal (wide) angle between the iris and the cornea, with or without glaucoma. Patients with known glaucoma are usually under the care of an ophthalmologist and many use miotic drops regularly; such patients can be given anticholinergic agents without special precautions. But in those with an unrecognized narrow-angle anterior chamber, the danger of pressure elevation with the use of a systemic anticholinergic drug is real (W. M. Grant, Pharmacol. Rev., 7:143, 1955).

Detecting a narrow-angle anterior chamber usually requires gonioscopy, and hence the aid of an ophthalmologist. While the routine use of a Schiotz tonometer for the detection of glaucoma is desirable in patients over 35, this procedure will not detect a narrow-angle anterior chamber; nor will a single normal reading rule out glaucoma.

Pre-operative Use—In one study, no increase in intraocular pressure occurred with the pre-operative use of a single intamuscular dose of atropine or scopolamine, even in the presence of narrow-angle glaucoma (H. Schwartz, et al., J.A.M.A., 165:144, 1957); but some patients may have a first attack of glaucoma in these circumstances. As a precautionary measure one per cent pilocarpine or other miotic eye drops can be administered.

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Woman's Auxiliary

Auxiliary Meets At Atlantic City

June 16-20th

The fortieth convention of the Woman's Auxiliary to the American Medical Association will be held in Atlantic City, New Jersey, June 16-20, 1963. Several changes are noted in the program this year. The annual tea and fashion show will be held on Sunday afternoon instead of Monday as in previous years. This tea honors the president, Mrs. William G. Thuss and the president-elect, Mrs. C. Rodney Stoltz.

An address by a member of the House Ways and Means Committee, discussion of suicide prevention programs, a report on our oversea embassy of health and a special award to television actress Donna Reed, will highlight the meeting.

A special teenage convention program has been planned for the children of A.M.A. and auxiliary members attending the convention.

The auxiliary program on medicine and religion will be featured at the postconvention conference for all members to be held Thursday, June 20th. The Reverend Dr. Paul B. McCleave, director, Department of Medicine and Religion of the A.M.A. will be the speaker.

19th Annual Meeting

The 19th annual meeting of the Woman's Auxiliary to the Connecticut State Medical Society was held at the Shoreham Oaks, 440 Asylum Avenue, Hartford on Wednesday, May 1st.

Mrs. Fritz Meyer of Fairfield County was installed as the new president.

After a business meeting in the morning at which the annual reports of officers and chairmen were heard, delegates were elected to represent Connecticut at the 40th meeting of the Woman's Auxiliary to the American Medical Association to be held in Atlantic City, New Jersey, June 16-20, 1963. This meeting also featured the awarding of AMA-ERF certificates by the state chairman, Mrs. Winfield Wight, the election of the 1963-1964 nominating committee for the state, the election of officers, and a memorial service.

The speaker for the meeting was Dr. Frederick B. Stare, chairman, Department of Nutrition, Harvard School of Public Health who spoke on "Nutrition—Fact, Fancy, and Foolishness."

Around The State

New London County

The newly elected officers of the New London County Medical Association are: President, Edward Gipstein, New London; Vice President, Casmir Bielecki, Norwich; Secretary-Treasurer, Clifford E. Wilson, Norwich; Councilor, Nicholas T. Phillips, Norwich and Alternate-Councilor, Hilliard Spitz, New London.

Clyde Deming and Maurice Pitock were guests at the annual county association meeting held at the Norwich Inn on April 4th.

Doctor's Office

Henry A. Adams, M.D., announces the opening of an office for the general practice of medicine at 58 Broad Street, Middletown.

Bernard B. Cohen, M.D., announces the opening of an office for the practice of surgery at 32 Maple Avenue, Windsor.

Herbert R. Kuhn, M.D., announces the opening of offices for the practice of gynecology and obstetrics at 599 Poquonnock Road, Groton, and 464 Oceon Avenue, New London.

Joseph W. Saidel, M.D., announces the removal of his office from 928 Lafayette Street to 923 East Main Street, Bridgeport.

A.M.A. Charges Fake To 'Health' Machine

Fake "health" machines not only take millions from a gullible public but hasten the death of thousands who delay valid medical treatment.

The machine quack who makes devices out of odds and ends of metals, wire and radio parts was denounced in Today's Health, official publication of the American Medical Association.

"With these gadgets — impressive to the gullible because of their flashing light bulbs, ticks and buzzes," the machine quack carries out "a vicious con game, capitalizing on people's respect for the electrical and atomic wonders of our scientific age," the article said.

In such diseases as cancer, tuberculosis, heart disease and diabetes, the article said, "Doctor Fraud's cure-all gadget" can prove fatal.

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Closed-Chest Heart Massage Successful In Stillborn

Closed-chest heart massage has been used successfully to resuscitate a stillborn infant, it was reported recently in the current *Journal of the American Medical Association.*

Less than one minute after the baby was delivered artificial respiration and closed-chest heart massage were begun. An anesthesiologist performed the heart massage, using two fingers to apply intermittent pressure to the infant's breastbone overlying the heart.

"Resuscitation continued approximately seven minutes before the baby began breathing spontaneously." "About two minutes later the respirations became regular."

The baby was discharged from the hospital in good condition five days later, and at three months of age showed no damage to the brain or nervous system.

From this case and similar reports, it appears that newborn infants can withstand the moderate chest compression necessary to activate the heart. This type of massage should be the preferred method of resuscitation in stillborns when resuscitation is deemed feasible.

Special Notices

TRUDEAU SCHOOL OF TUBERCULOSIS and OTHER PULMONARY DISEASES

Forty-eighth Session

June 3-21, 1963

The Forty-eighth Session of the Trudeau School of Tuberculosis and Other Pulmonary Diseases, established in 1916, will be held in Saranac Lake, N. Y. from June 3rd to 21st, 1963. This annual, unique postgraduate course for physicians, conducted under the auspices of the Trudeau Foundation and supported by the Lillia Babbitt Hyde Foundation, provides outstanding instruction in the field of chest diseases at a minimal tuition of $100 for a three weeks session. Attendance at the Trudeau School carries with it a thorough review for specialization in pulmonary diseases or for work in public health involving tuberculosis.

The local medical faculty of approximately thirty doctors from Saranac Lake, Ray Brook State Tuberculosis Hospital, the Sunmount Veterans Administration Hospital and the Will Rogers Hospital, and about thirty of the leading teachers and investigators in the field of chest diseases in the eastern United States and Canada, lecture and conduct seminars in their special fields. Approximately half of the time is devoted to tuberculosis and the other half divided between such subjects as silicosis, pulmonary fibrosis, emphysema, fungus infection, sarcoidosis, pneumonias and intrathoracic tumors.

The enrollment is necessarily limited and therefore application should be made early.

Inquiries should be addressed to the Secretary, Trudeau School of Tuberculosis and Other Pulmonary Diseases, Box 670, Saranac Lake, N. Y.

YALE UNIVERSITY SCHOOL OF MEDICINE

Announcement of Postgraduate Course

DIAGNOSTIC VIROLOGY

(Epidemiology and Public Health 320)

July 8-July 19, 1963

Course Description: Seminars on problems encountered in a virus diagnostic laboratory and practical sessions on procedures for isolation and identification of viruses from clinical specimens.

Requirements: Ph.D., M.D. or equivalent training, plus general knowledge of tissue culture and elementary virology are prerequisite. (Limited to 10 participants).

Fee: $100.00 will be charged to meet the cost of materials. Make checks payable to Yale University.

Course Schedule: 5 days a week for two weeks.

Course Duration: From July 8 to July 19, 1963.

Inquiries should be directed to: Dr. G. D. Hsiung, Department of Epidemiology and Public Health, Yale University School of Medicine, 333 Cedar Street, New Haven, Connecticut.

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In addition to the above, members up to age 40 may now purchase their Accident and Health protection at a 25% reduction in cost.

Through its continued official sponsorship of our Group Plans, The Connecticut State Medical Society has once again made it possible to offer broadened coverage under these two time-tested policies to members of the Society. If you are not now enrolled, do not turn your back on old friends who have served Connecticut physicians for over a quarter of a century. If a sufficient number of new applications are submitted for the Major Medical Expense Plan, all policies will be issued regardless of past medical history. For full information write or phone.

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NEW BOOKS IN REVIEW

ANATOMY IN SURGERY by Philip Thorek, M.D., F.A.C.S., F.I.C.S. Second Edition, J. B. Lippincott Company, Philadelphia, Pennsylvania, 1962, 904 pp. $22.50.

Reviewed by: IRA S. GOLDENBERG

Surgical therapy presupposes knowledge by the surgeon of many fields of endeavor—anatomy and operative technique being among the more important ones. Anatomical texts by anatomists are numerous and of necessity involve the greatest of detail in discussing any area of the human body. Because of this detail, unfortunately, they are not the easiest texts to use as rapid reference material. By the same token, tomes of surgical technique are usually precise and detailed, as is required by the practicing surgeon. A marvelous wedding of these two functions was primarily accomplished in 1951 by Dr. Thorek in the first edition of this book. He directed the book particularly to the medical student and resident physician who desired a text which "narrowed the gap between freshman anatomy and operative surgery", as Dr. Thorek expressed it in the preface. Eleven years later, the second edition has appeared and the basic reason for this book's existence is emphasized again.

In a regional manner the author discusses anatomy and then emphasizes how this anatomy is approached for surgical therapy of specific lesions. The illustrations, both black and white and in color, are outstanding contributions by the medical artist, Carl T. Linden, to whom much credit is due for clarification of text material. They are among the best that have ever been prepared for a textbook.

Dr. Thorek discusses the commonest operations of each organ system, but does not elaborate the whys-and-wherefores of the operation. Thus, surgical judgment is not a part of the book and the author is to be commended for this attitude. The result is a succinct book instead of an overwhelming mass of material intended to be a complete compendium of surgical therapy.

This book is highly recommended for medical students and house officers but is perhaps even more valuable as a surgical text in the library of the non-surgeon to be consulted as necessary concerning important correlations among the patient's clinical status, his anatomy and therapeutic surgery. Even the accomplished surgeon, however, will appreciate this book as a ready reference to those anatomic areas with which he may not be dealing every day. Dr. Thorek has been criticized for over-simplification but, as he states in the preface to this second edition, "Such criticisms must be accepted graciously if one believes that it is better to understand a little than to misunderstand a lot."

A SHORT HISTORY OF CLINICAL PATHOLOGY by W. D. Foster. E. & S. Livingstone Ltd., Edinburgh and London, 1961, 154 pp. $6.50.

Reviewed by: DAVID SELIGSON

The author has reviewed the origins of medicine and the laboratory and tied these together to show the interrelationships in growth. The evolution of the clinical laboratory is well pointed out in this manner. He divides clinical pathology as the British do into four main branches: "Morbid anatomy, clinical pathology, bacteriology and hematology." In this country, a trend exists to combine the hospital practice of anatomical and surgical pathology as one unit and blood banking, clinical chemistry, clinical microscopy and hematology as another unit, the latter being called clinical pathology.

Dr. Foster traces out the great discoveries, the teachers, the application of instruments and the development of clinical laboratories. The development of clinical pathology as a unified area of the practice of medicine has not been easy. The foresight of leading physicians 50 to 100 years ago who insisted that "clinical pathology" was essential in the practice and teaching of medicine was indeed modern. The obstructions relating to inadequate support, money and recognition are not outdated yet.

Dr. Foster has presented his history and thoughts in clear, readable English and has made it very interesting. One interested in clinical pathology, the evolution of medical disciplines, or medical history should read this book.

ANTICOAGULANTS AND FIBRINOLYSINS. Edited by R. L. MacMillan and J. F. Mustard. Lea & Febiger Company, Philadelphia, Pennsylvania, 1961, 449 pp. $10.00.

Reviewed by: LOUIS H. NAHUM

In this group of forty-five papers by forty-eight authorities, we find a group of experts talking to each other. Many questions which are the concern of the practicing physician who uses anticoagulants, are brought up and discussed. What is the best test to determine effective therapy? It turned out that the prothrombin time is as good as any. What about long term anticoagulant therapy in patients that had recovered from myocardial infarction? Apparently no real evidence exists that after six months to a year there is any difference in morbidity or mortality between treated and untreated groups. The protagonist of the treated group, Manchester, gave impressive data in favor of long term treatment. Brown found no beneficial effect. Although his dosage was less than Manchesters, his hemorrhagic complications were higher. Left up in the air, therefore, was the question whether long term intensive anticoagulant therapy in co-operative patients is worth while. Some of the reasons why differences between observers occurred, emerges from a consideration of the absence of sufficient controls necessary for evaluation of results. Controls seemed to be hard to come by. Another reason seemed to be derived from the nature of inducing the anticoagulant state by the Coumarin derivatives. Early in the production of anticoagulation the patients go through a hypercoagulable state. Similarly, as the effect wears off, there is also a hypercoagulable state. The result must be that as the prothrombin time rises and falls, many patients may thrombose more readily.

Apparently to achieve anticoagulation and keep it that way one requires a prothrombin time of two to two and one-half times the normal, a level difficult if not impossible to main-

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tain constant without complications. Manchester alone was able to report success, but he also gave his patients ascorbic acid. Experimental evidence was offered to indicate that the Coumarin drugs must be given in doses which produce significant changes in coagulation before there is any marked inhibition of thrombus formation. Small doses may promote thrombogenesis. Therefore, enhancement of thrombosis in part of a group of patients under study will mask any beneficial effects in the remainder.

The beneficial effects, however, can only be achieved with increased incidence of hemorrhage. The hemorrhagic complications were discussed at considerable length. In this connection Jacques found that spontaneous hemorrhage in animals does not occur simply from administration of anticoagulants. There must be simultaneous interference with other hemostatic mechanisms by poisoning or by stress, various types of which may damage blood vessels.

Patients with intermittent attacks of cerebral ischemia due to basilar artery or carotid artery disease seemed to benefit from anticoagulant therapy. So did patients with prodromal signs of myocardial infarction which Storrie considered analogous to those suffering from intermittent attacks of cerebral ischemia. On the other hand, anticoagulation was found to be of no value in patients with completed strokes.

The last two chapters were devoted to fibrinolysis. The preparations for inducing fibrinolysis were still poorly standardized and their use in clinical cases is not yet feasible.

This book is certainly useful to the physician who is especially interested in thrombo-embolism. He will see that we are still learning about the anticoagulant drugs. We are still in doubt as to whether we are using them intelligently. We still do not know all about the adequacy of the drugs and we do not even know whether the differences of opinion arise from an erroneous approach to the problem.

PERTHES AND PARENTS by V. W. Rosar. Monograph No. 525 of American Lectures in Orthopaedic Surgery. Editor—Charles W. Goff, M.D., Hartford, Connecticut. Charles C. Thomas Publishers, Springfield, Illinois, 94 pp.

Reviewed by: DENIS S. O'CONNOR

When protracted illness strikes in a family it is the unusual family that is prepared for the readjustment in daily living which such an illness demands. And, Perthes, Legg-Perthes, or Legg-Calve-Perthes Disease which are different designations for osteochondritis deformans juvenalis of the hip joint, a condition of childhood, though not devoid of hope for a good result, nevertheless can put a severe strain on the family relationships and can end disastrously to the child unless the condition and its implications are understood and approached intelligently.

For these reasons, the orthopaedic surgeon who must oversee the care of the child should welcome this little volume which could prepare the mother of the afflicted child in the handling of the many problems which this condition presents. Indeed, the problems presented by Legg-Perthes Disease have many similarities to other hip joint diseases of childhood and could be read with benefit by families who have those problems.

The importance of any hip condition in childhood is the damage which may show up in later life as a result of the trauma of use over a period of years superimposed upon the original incongruity of the hip joint elements.

Keeping the damage in the hip joint to a minimum in childhood can be an example of preventable disability in later life and if for no other reason the fullest understanding of Legg-Perthes Disease and its implication by the family is desirable.

While a doctor should read this book to insure that it represents his own advice, in the hands of the family of the Legg-Perthes victim it can be a tremendous help in guiding the mother who after all, as usual, must bear the brunt of the child's disturbed routine.

THORACIC DISEASES: Emphasizing Cardiopulmonary Relationships by Eli H. Rubin, M.D., Morris Rubin, M.D. in association with George C. Leiner, M.D. and Doris J. W. Escher, M.D. W. B. Saunders Company, Philadelphia and London, 1961, 968 pp. $25.00.

Reviewed by: LOUIS H. NAHUM

Rapid progress in the epidemiology of disease and highly perfected techniques in the study of cardiopulmonary physiology now require a synthesis of this knowledge. A higher integration of the hitherto departmentalized studies in order that this knowledge may be better applied clinically. In this book the student will be oriented in current developments in thoracic diseases.

X-ray examination, the functional and anatomic association between the heart and lungs are clearly brought out. Primarily respiratory system diseases are dealt with in one section and in another section are features in which the cardiopulmonary system is primarily involved. There are chapters dealing with surgically treated lesions and the physiologic disturbances encountered during thoracic emergencies.

A sizable portion of this book is devoted to intrathoracic neoplasms. Adequate space is allotted to tuberculosis because the disease is still a major cause of death in many parts of the world even though the incidence has declined greatly in this country in recent years.

There are covered pulmonary tension disorders and intrathoracic anomalies of infancy. There are included comparatively bizarre lesions as a result of employing newly developed diagnostic techniques. Some iatrogenic diseases are also covered in this book.

The concluding section XIII deals wtih principles of diagnosis on which history taking is emphasized as providing a good basis for pursuit of a diagnosis by more objective methods.

The book is divided into thirteen sections, Section I is devoted to the thorax and its contents, containing anatomy, roentgenology and bronchovascular maldevelopments. Section 2 deals with cardiac catheterization angiocardiography diseases of the lesser circulation and pulmonary infarction. Section 3 deals with the respiratory features of the cardiopulmonary relationships. Section 4 on thoracic diseases of the young. Section 5 deals with the pneumonias. Section 6 with the bronchial obstructive diseases. Section 7 with intrathoracic neoplasms. Section 8 with tuberculosis. Section 9 with occupational and environmental lung diseases. Section 10 with thoracic manifestations of systemic diseases. Section 11 with diseases of the pleura and subjacent structures. Section 12 with thoracic injuries and emergencies and Section 13 with principles of diagnosis.

Each section is followed by an extensive bibliography and a good index completes the book, which is well printed. This book should appeal to all internists for an up to date coverage of cardiopulmonary diseases and could be a source of reference for students and interns.

AN ATLAS OF HEAD AND NECK SURGERY by John M. Lore, Jr., M.D. Illustrated by Robert Wabnitz. W. B. Saunders Company, Philadelphia, Pennsylvania, 1962, 490 pp. $25.00.

Reviewed by: LOUIS H. NAHUM

Reunification of all groups interested in the field of surgical problems related to the head and neck is the intention and aim of this atlas of surgical techniques.

The book consists of seventeen chapters, bibliography and an index. It presents sectional radiographic anatomy, general operative procedures. The sinuses, the nose fractures of facial bones, the face, the eye-lids, the ears, the lips, the salivary glands, tumors and cysts of the mandible, the oral cavity, the neck, the thyroid and parathyroids, the larynx, the esophagus and the major vessels of the head, neck and superior mediastinum.

It is obvious that surgery of the head and neck has a regional and a general aspect. The book is really a plea for broad training in general surgery after which it will become possible to unite the various subspecialties dealing with this area such as otolaryngology, plastic and reconstructive surgery, maxillofacial surgery, neurosurgery, oral surgery and thoracic surgery. Any one who does surgery of the neck must be prepared to extend his resection, and he must not be hampered by a lack of familiarity with thoracic surgery because the disease may extend below the clavicle.

There is also a succinct presentment of essential diagnostic procedure as well as basic surgical techniques. This book signalized the development of head and neck surgery as a significant development in American surgery. As the subject has matured illustrative documentation of the surgical procedures applicable to this area, has become essential and the book is the successful culmination of such an effort. It is probably the most complete work relative to techniques in surgery of the head and neck that has thus far been completed. The illustrations are numerous, detailed and follow each other in a clear well-correlated sequence. The text is single, clear, brief but complete.

The author began by training in otolaryngology but soon realized that a broad basic knowledge relative to principles and practice of general surgery and its allied specialties was necessary. Accordingly he obtained an extensive formal residency training in general surgery. One year he spent in an experimental surgical research laboratory and another he devoted to the surgical aspects of tumor therapy. It was this background together with "the talent for original creative thought: that in the opinion of Dr. Madden in the prologomena provided the basic reason for the author to complete this unique effort.

It is certainly a unique effort and should be carefully studied by all general surgeons, thoracic surgeons, as well as head and neck surgeons. They will be better equipped to pursue their task successfully. Praise is also due to the publishers who have achieved a consummate job in excellent printing and plate reproduction.

IMMUNOASSAY OF HORMONES, Ciba Foundation Colloquia on Endrochinology, Volume 14, Editors, G. E. W. Wolstenholme and Margaret P. Cameron, Little Brown and Company, Boston, Massachusetts 1962, 432 pp., $10.75.

REVIEWED BY DAVID SELIGSON

As purer and purer proteins and other antigens appear investigators are finding the means to obtain antibodies for them. Immunologic techniques using these antibodies in association with electrophoresis, radioactive isotopic labels, gel diffusion and more traditional methods are yielding information of fundamental importance in endocrinology concerning peptide hormones. These techniques are now being used to detect minute quantities of hormones (human growth hormone, insulin, glucagon, thyrotropin, corticotropin, gonadotropins and prolactin). The presentations and subsequent discussions lead the reader to a good appreciation of the careful studies the participants of the symposium have made in order to reduce or eliminate artifacts and erroneous conclusions. The relationships of circulating hormones to diabetes, thyroid disease and pituitary disease have been pointed out and discrepancies such as circulating insulin in diabetes were noted and discussed. The colloquium is timely and provides useful information for endocrinologists, investigator, clinical pathologists who are watching this field for new diagnostic tests and physicians who look for new data to explain some of their clinical observations.

GENERAL PATHOLOGY. Based on Lectures delivered at the Sir William Dunn School of Pathology, University of Oxford. Edited by Sir Howard Florey, Professor of Pathology. Third Edition. W. B. Saunders Company, Philadelphia and London, 1962, 1104 pp. $22.00.

Reviewed by: LOUIS H. NAHUM

This book has seventeen famous contributors and consists of forty-four chapters covering in greater or lesser detail the principles of pathology. It is based on lectures delivered at the Sir William Dunn School of Pathology at the University of Oxford. It is really the third edition which has a new subject, the immunology of tissue transplantation. The lectures do not form a complete survey of general pathology but deal with one or other of the subjects in which the authors have a special interest. But they all deal with one or more of the fundamental changes that take place in the body in response to injury and discuss in detail some present day views about the nature and causes of such changes.

Progress in medical science has made many men narrow specialists and has produced a great volume of literature that is almost impossible to read. The student therefore, must try to grasp what is known of the general principles underlying the pathological changes that he will be called upon to diagnose and treat. The fundamental reactions to disturbances which occur in the body can be met in practically every pathological condition. Every sick person is a functionally deranged organism. The point of view that the authors wish the student to develop is one that will lead him to ask himself in every case "What do the observations of whatever nature that I make tell me about the disease process from which my patient is suffering." They urge the student never to be intellectually satisfied with a diagnosis or a label. They recognize that the student who searches for causes and first principles will be the most alert student and practitioner.

One will find in this book historical development of pathological ideas, synthesis of knowledge and excellently written text. It is modern, very up-to-date and a valuable reference not just for students but physicians who wish to keep abreast with growing knowledge in dynamic pathology.

CLINICAL PATHOLOGY. Application and Interpretation. Third Edition by Benjamin B. Wells, M.D. W. B. Saunders Company, Philadelphia and London, 1962, 541 pp. $9.00.

Reviewed by: LOUIS H. NAHUM

This excellent book is the third edition, the first having appeared in 1950. Its author was Professor of Medicine, Creighton University School of Medicine, Omaha and now is Assistant Chief Medical Director for Research and Education in Medicine, Veterans Administration.

This is a completely rewritten work offered to students and physicians as a guide in the application and interpretation of clinical laboratory methods. But the philosophy has not changed. Wisely the author recognizes that laboratory tests should be used for improving diagnosis and evaluating therapy. He emphasizes that the laboratory is endangered by unnecessary tests which many internes, students and physicians would wish to employ to replace their physical diagnostic acumen. He also points out that for research purposes the clinical pathologist must be a part of the investigating team so that the results can be reliably meaningful.

The material is arranged exactly as the physican uses it. It begins with the clinical problem and then useful laboratory tests are named and discussed. There is also some theory and methodology included to give proper meaning to the procedures and to define their limitations.

There are ten chapters given over to every area of medicine. Infectious diseases, diseases of the gastrointestinal tract; of the respiratory system; of the cardiovascular system; of the kidney and urinary tract, of the blood. There is one on metabolic and endocrine disorders on clinical laboratory studies in surgery and in obstetrics. Chapter 10 deals with laboratory procedures per se. After it, is presented a table of normal values. The fact that Chapter 10 could have introduced the other chapters is less significant than that throughout the book every student will be stimulated to find that contact with the laboraory can be a most rewarding experience. Through this book he will learn three things about every laboratory procedure: (1) When to use it, (2) how to interpret the results and (3) what technical or physiologic limitations must be taken into account in its interpretation. If a physician makes the most of his physical diagnostic acumen, and uses a laboratory wisely and well it can be expected that he will become an astute clinician. This book will help him in the second part of successful diagnosis and therapy. There are certain minor things that could be corrected such as the statement that in over 95 per cent of hypertension, no cause is found. Many cases are due to renal artery stenosis. Over 15 per cent are due to pyelonephritis. However, such minor points do not detract from the excellent treatment of the problem of using the laboratory in diagnosis and treatment of disease. It is highly recommended to students and all physicians.

BOOKS RECEIVED

Books received for review are acknowledged in this department and such acknowledgement must be regarded as a sufficient return for the courtesy of the sender. Selection will be made for review in the interests of our readers and as space permits.

Current Diagnosis & Treatment. By Henry Brainerd, M.D., Sheldon Margen, M.D. and Milton J. Chatton, M.D., Lange Medical Publications, Los Altos, California, 1963, 843 pp. $9.50.

Medical Laboratory Technology. By Matthews J. Lynch, M.D., Stanley S. Raphael, M.B., Leslie D. Mellor, Peter D. Spare, Peter Hills, and Martin J. H. Inwood, W. B. Saunders Co., Philadelphia, Pa., 1963, 735 pp. $12.00.

Surgery. By Richard Warren, M.D., W. B. Saunders Co., Philadelphia, Pa., 1963, 1397 pp. $19.50.

Transplantation. Ciba Foundation Symposium, G. E. W. Wolstenholme and Margaret P. Cameron, Little, Brown & Co., Boston, Mass. 426 pp. $12.00.

Synopsis of Pediatrics. By James G. Hughes, M.D., The C. V. Mosby Co., St. Louis, Mo., 1963, 1031 pp. $9.85.

Pye's Surgical Handicraft 18th Edition. By Hamilton Bailey and James Kyle, Editors. The Williams and Wilkins Co., Baltimore, Maryland, 1962, 424 pp. $8.50.

The Nature of Biochemistry. By Ernest Baldwin, Ph.D., Cambridge University Press, New York, 1962, 111 pp. $1.45.

Physiology of the Circulation in Human Limbs in Health and Disease. By John T. Shepherd, M.D., W. B. Saunders, Philadelphia, Pa., 1963, 416 pp. $12.00.

Current Therapy 1963. By Howard F. Conn, M.D., W. B. Saunders Co., Philadelphia, Pa., 1963, 775 pp. $12.50.

Time, Cells, and Aging. By Bernard L. Strehler, Gerontology Branch, Baltimore City Hospital, Baltimore, Maryland, Academic Press, New York and London, 1962, 270 pp. $2.95.

The Management of the Anxious Patient. By Ainslie Meares, M.D., W. B. Saunders Co., Philadelphia, Pa., 1963, 493 pp. $9.00.

This Air We Breathe. By Clarence A. Mills, M.D., The Christopher Publishing House, Boston, Mass., 1962, 172 pp. $4.00.

Inhalation Anesthetics and Carbohydrate Metabolism. By Nicholas M. Greene, M.D., The Williams & Wilkins Co., Baltimore, Maryland, 1963, 143 pp. $7.00.

The Fat Boy Goes Poly-Unsaturated. By Elmer Wheeler, Doubleday & Co., New York, 1963, 156 pp. $3.50.

Salt-Water Retention Seen As Clue To Obesity Control

The body's retention of salt and water during a weight reduction program "may be the greatest single cause of failure in the treatment of obesity," Dr. S. K. Fineberg, New York City, said today.

Ten to 20 pounds of water may be retained before there is any apparent sign of edema, medical term for the condition, Dr. Fineberg said in the current Journal of the American Medical Association.

"After several weeks or months of fat loss, if water retention occurs, the scale-weight loss stops or even reverses, despite the patient's adherence to the same caloric intake and *actual loss of fat tissue,"* he said. "The perplexed patient assumes that he cannot reduce his weight further and soon abandons treatment."

Apparently, he said, the incidence and severity of water retention is far greater in women.

"This fact may help to explain the higher success rates consistently found in men," he said. "Indeed, the patient's sex has been quoted as the only criterion which might aid in predicting the outcome of attempts at weight reduction."

Dr. Fineberg drew his conclusions from a study of the treatment of 36 overweight diabetics at a special clinic. The patients were all 50 to 100 per cent overweight and were seen at the clinic once a month for periods of six months to one year, he said.

At the end of the year, 23 of the 36 patients had lost an average of about 22 pounds during an average of nine and one-half months, he said. Fifteen patients were able to discontinue specific drugs for diabetes entirely, he said.

"The rate of success attained in this clinic, almost 80 per cent at the end of the first year, is remarkably high," Dr. Fineberg said.

"The reasons for the almost unprecedented success rate obtained are believed to be better motivation, less psychological obesity in diabetics, and improved technique in using anorexigenic [appetite suppressing] agents, but, most important, the detection and correction of water retention in more than one-half of the patients. This well-known phenomenon of unexplained origin has not heretofore been documented as occurring with such persistence and high incidence.

"The experience in this clinic suggests that onset of prolonged salt and water retention during weight reduction may be the greatest single cause of failure in treatment of obesity."

Calorie-Restricted Diets For Weight Reduction

The Advisory Nutrition Committee to the Public Health Committee of the Connecticut State Medical Society calls your attention to a new set of calorie-restricted diets available to physicians for use with patients on a weight reduction program. The diets are calculated for 1000, 1200, 1400 and 1800 calorie levels. Each carries a statement of review by the Council on Foods and Nutrition, American Medical Association.

To give direction for planning these diets, a research conference was called by the National Dairy Council. Participating were three prominent researchers in the area of weight reduction: Dr. Margaret Ohlson, Director, Dept, of Nutrition, State University of Iowa; Dr. Charlotte Young, Professor of Medical Nutrition, Cornell University Graduate School of Nutrition; and Dr. Robert Olson, Professor of Biochemistry and Nutrition, Graduate School of Public Health, University of Pittsburgh. This group recommended that individual diet instruction sheets be developed at various calorie levels with a supplementary sheet for the physician.

While a weight reduction regimen is difficult for most people, it is generally agreed that a likelihood of success is greater if the individual has a thorough understanding of the program he is to follow. Each diet has been outlined so clearly that a patient can understand even when the plan is not explained in detail. Space has been allowed for the physician to write in special recommendations.

Consideration has been given to the patient's taste, outlining a routine which is socially acceptable. Foods which are accessible, economical and sufficient in variety to be combined into normal meals are suggested. It is, of course, difficult to plan a weight reduction program which will meet all of the patients needs without individualized planning. Even with individualized planning, it is impossible to foresee every conceivable choice with which the patient is confronted. Therefore, a plan which teaches composition of food in terms of food groups, permits flexibility and prepares the patient to meet different situations.

These simple to use diet sheets were developed by the National Dairy Council; their copyright appears only on the explanatory sheet for the physician. This material may be obtained from the Connecticut Dairy and Food Council, 95 Niles Street, Hartford 5, Conn. The service is available to physicians and dietitians, without charge.

Marian Arnold, *Executive Director*
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Connecticut Medicine

Connecticut State Medical Journal

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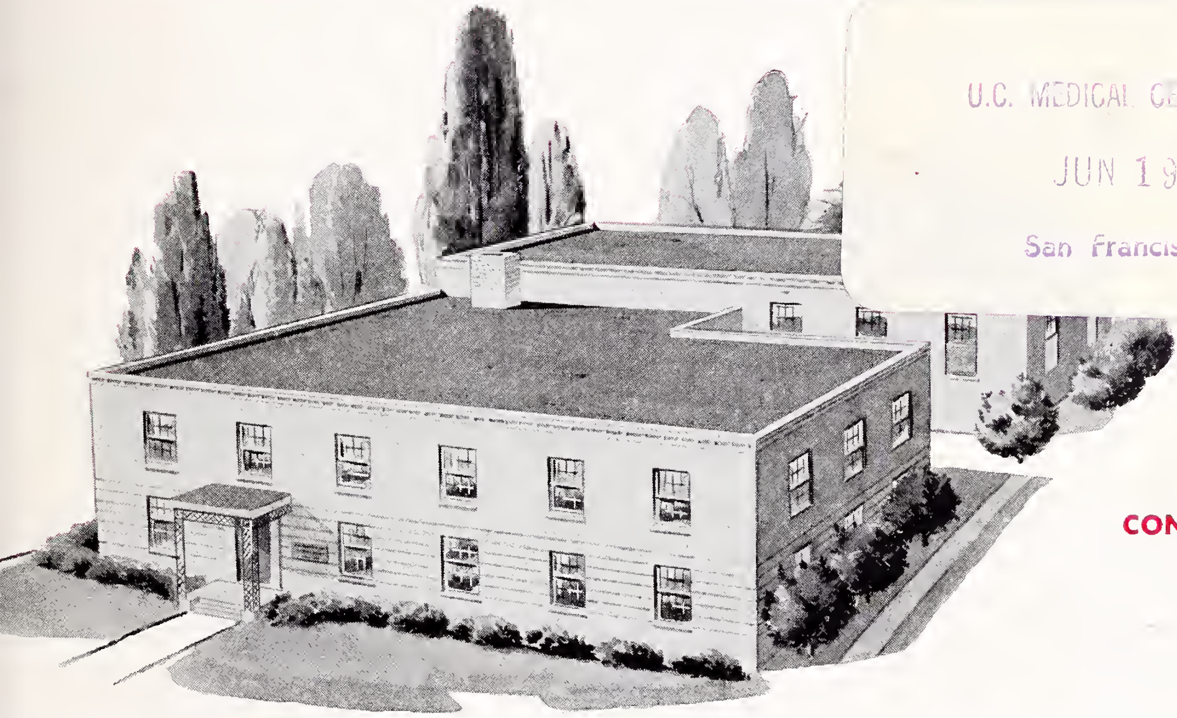

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SCUBA AND SKIN DIVING NUMBER: FRIEDA G. GRAY, M.D., Guest Editor

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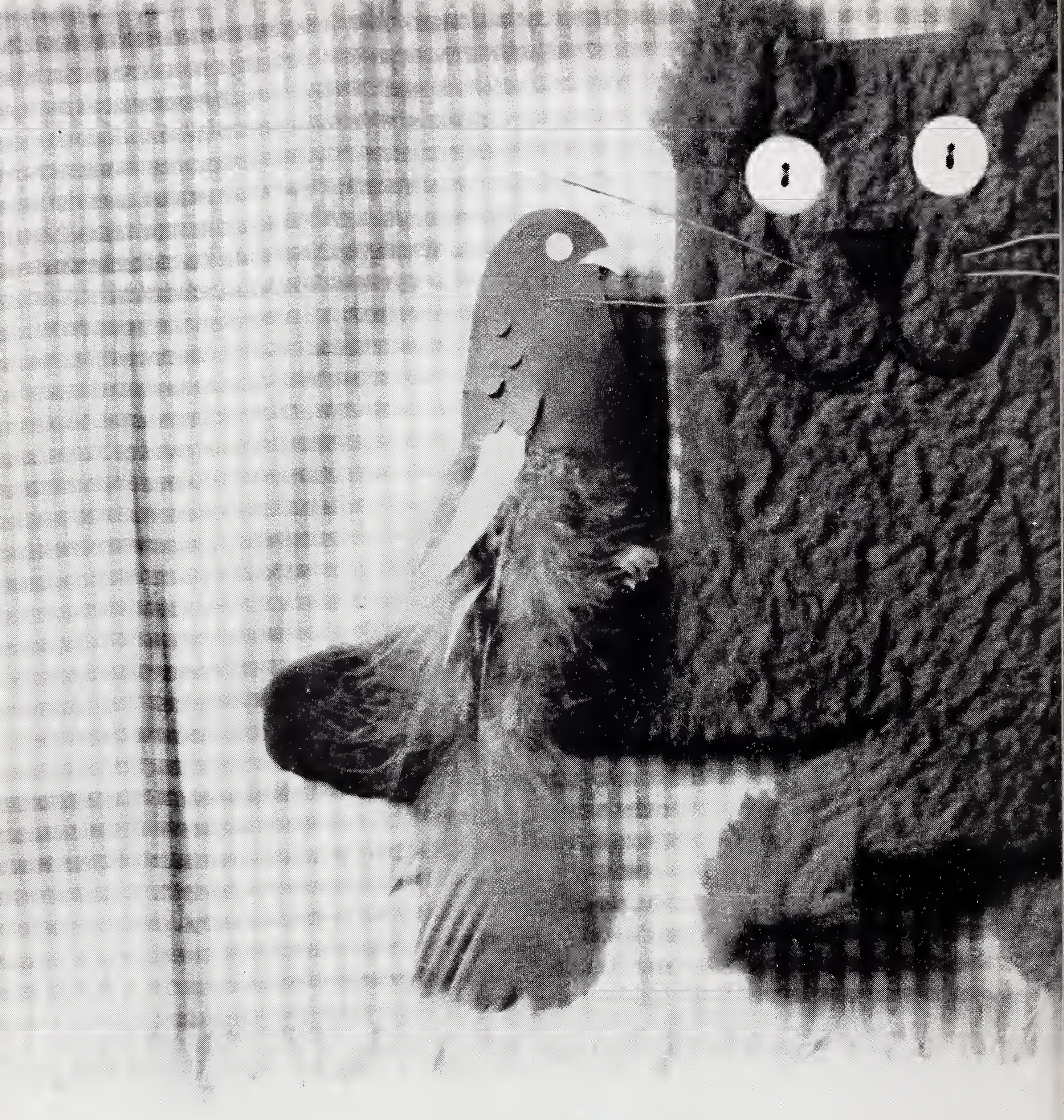

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A George Blumer Memorial

Those of us who so greatly miss the sage and spritely editorials of George Blumer, a long time feature of this Journal, welcome the news that a memorial book fund in his memory is being established at the Yale Medical Library. In the long history of our Society no member of the Yale Medical Faculty endeared himself more to Connecticut physicians than did George Blumer. We owe his memory a debt which never can be fully paid. He served the Society in many offices including those of president, councilor, and delegate to the American Medical Association. George Blumer, the pupil of William Osler like his great master had deep feeling for the practicing physician and today medicine in Connecticut is better medicine because his outgoing spirit found response in the efforts of her doctors. Why not send a check today made out to Yale University to the Yale Medical Library, F. G. Kilgour, Librarian?

Health Exhibits At County Fairs

"Immunize—For Family Protection" will be the theme of exhibits to be sponsored by the Committee on Rural Health of the State Medical Society, under the chairmanship of G. S. Gudernatch, M.D., Sharon, at nine county fairs throughout the state next fall. Members of the Woman's Auxiliary of the Society will manage the exhibits and distribute free health education pamphlets.

The county fairs at which this exhibit is being planned for are the Goshen Fair, August 31, September 1 and 2; the Woodstock Fair, August 31, September 1 and 2; the North Haven Fair, September 5, 6, 7 and 8; the Bethlehem Fair, September 7 and 8; the Union Agricultural Society Fair, Somers, September 24 and 25; the Durham Fair, September 27, 28, and 29; the Stafford Fair, October 3, 4, 5, and 6; the Berlin Fair, October 4, 5, and 6; and the Riverton Fair, October 12 and 13.

The purpase of the exhibit program is to stimulate a more universal approach by individuals and families to the whole question of immunization against diseases. To emphasize this point a statement is included on each exhibit stating "consult your family physician."

New Haven County Semi-Annual Meeting

The 180th Semi-Annual Meeting of the New Haven County Medical Association will be held on Thursday, October 24, 1963, at the Waverly Inn, Cheshire, Connecticut. The business meeting is tentatively scheduled for 2:30 P.M.

Further details will be furnished as soon as arrangements are completed.

Annual Meeting Of The A.M.A. In Atlantic City June 16-20, 1963

The latest information on some of the most common problems that confront physicians will be presented at eight general scientific sessions during the annual meeting of the American Medical Association in Atlantic City, June 16-20.

Heart attacks, cancer, peptic ulcer, heredity, obesity, veneral disease, and painful back will be covered in lectures or panel discussions.

A series of lectures on modern concepts of acute myocardial infarction, including basic physiologically and pathological considerations, will be presented.

A day-long symposium on strokes is scheduled on Wednesday, June 19.

The question, "What Drugs for What Cancers by What Doctors?" will be answered by Donald B. Rochlin, M.D., Los Angeles, Albert Segaloff, M.D., New Orleans, Robert G. Ravdin, M.D., Philadelphia, and Fred J. Ansfield, M.D., Madison, Wis., in lectures followed by a panel discussion.

A full day's program will be devoted to a symposium on newer knowledge and therapy of peptic ulcer on Monday, June 17.

A panel discussion on medical genetics will bring together David Y. Y. Hsia, M.D., Chicago; Harold F. Falls, M.D., Ann Arbor, Mich.; Maurice T. Fliegelman, M.D., Louisville; E. Burke Evans, M.D., Galveston, Texas, and David C. Fainer, M.D., Baltimore.

Various problems associated with the treatment of obesity will be explored by a six-man panel.

Fluoride

About 100 communities fluoridated their water supplies during 1962, the U.S. Public Health Service reported. It added that more than 2,300 communities with a total of more than 43 million residents now have fluoridated water.

Seat Belts

Laws requiring that front seat belts be installed on all new cars were signed by governors of Tennessee and Indiana. The Tennessee law requires that belts be installed by manufacturers, beginning with 1964 models, before cars are shipped into the state. The Indiana law becomes effective January 1, 1964. Other states are considering similar legislation, with Nebraska's legislature having passed a law that is awaiting the governor's signature.

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Letters To The Editor

May 1, 1963
Stony Creek.

To the Editor:

Your editorial entitled "Old Age Or Sickness" which appeared in the April issue of CONNECTICUT MEDICINE is the most interesting I have read. You should do a book on it. I sometimes wonder just what is a physician today. He is a miracle worker all right but there are situations he is called upon which he too handily brushes off because they are "uninteresting" or something.

Sincerely yours,
Herbert Thoms, M.D.

April 17, 1963
Meriden, Connecticut

To the Editor:

I have read with great interest the editorial on "The Anti-Coagulation Controversy" in the April 1962 issue of CONNECTICUT MEDICINE.

To many of us who are faced with the problem of whether or not to use anti-coagulants it is heartening to realize that at last we are given the opportunity to make this decision ourselves rather than to be forced to do something because of the possibility of medical-legal involvement.

This problem does not only involve internists who are using anticoagulants for acute myocardial infarction. In a recent issue of the *British Medical Journal,* Dr. S. Sevitt discussed the dangers of anticoagulent treatment in the elderly especially in relation to prophylaxis in elderly patients with fractured hips. The same controversy as to whether or not to use anticoagulants exists here. While he concludes that thrombosis and embolism may be avoided in many cases by the use of these drugs, I should like to quote a statement he makes which I think probably sums up the present attitude of many of us. This statement is as follows; "The truth of the matter is that anticoagulant prophylaxis is not a penny in the slot machine. It has contraindications and difficulties but the benefits outweigh the disadvantages. Proper control and supervision of many patients take time and need added personnel in a busy department."

Yours sincerely,
Max Caplan, M.D.

April 11, 1963
Brooklyn, New York

To the Editor:

A paper of mine entitled "The Roles of Estrogen and Progesterone in Breast and Genital Cancer," published in *The Journal of the American Medical Association,* continues to attract considerable attention. (Wilson, R. A.: 182: 327-331 [Oct. 27] 1962). Requests for reprints continue to arrive; many from abroad and from behind the Iron Curtain. This paper concludes: "The evidence presented indicates that estrogen and progesterone are prophylactic to breast and genital cancer to an unknown degree. It is urgent that this process be intensively investigated. It would seem advisable to keep women endocrine-rich (estrogen-progesterone) and consequently, cancer-poor throughout their lives. A consequence of this would be the elimination of the menopause." In 2387 years of patient-exposure to exogenous estrogen, no breast or genital cancers occurred although 18 was the expected incidence.

A related article entitled "The Fate of the Nontreated Postmenopausal Women, A Plea for the Maintenance of Adequate Estrogen from Puberty to the Grave" by Wilson, R. A. and Wilson, T. A., appears in the April issue of *The Journal of the American Geriatrics Society*. In this article it is shown that the menopausal woman is not normal; she suffers from a deficiency disease with serious sequelae and, without exception, needs treatment.

A third and key paper by Wilson, R. A., Hagstrom, H. T., Brevetti, R. E., and Wilson, T. A., entitled "Specific Procedures for the Elimination of the Menopause" will appear with an accompanying editorial in the May-June issue of *The Western Journal of Surgery, Obstetrics and Gynecology*. If the suggested appropriate methods are employed, a woman approaching the climacteric will not experience it, and the postmenopausal woman will be restored quickly to the premenopausal state. The degree of femininity (estrogenicity) of any woman whether young, perimenopausal, or postmenopausal, can be easily determined by an analysis of the percentages of superficial, intermediate and parabasal cells in the Papanicolau smear. This cytohormonal assay is the only practical guide in the management of the menopause.

Today the menopause is as obsolete as the bow and arrow. No woman need experience it or live with its cumulative effects. The re-education of almost every man, woman and physician in the civilized world is needed.

I feel certain that you will find this effort towards the final emancipation of women of interest.

Very truly yours,
Robert A. Wilson, M.D.

May 7, 1963
Waterford, Connecticut

To the Editor:

Many times in the past two years, when I have enjoyed reading your editorials, I have thought of writing you and telling you how much your work has meant to me as a graduate in medicine before the recent advances. I am overwhelmed by the new discoveries, and, I must admit, far behind the times. Your writings have done much to give me some idea as to what it is all about.

Keep up the good work because, I am sure, all the men who read them enjoy them, even though we do not write to tell you so.

Sincerely yours,
John F. O'Brien, M.D.,

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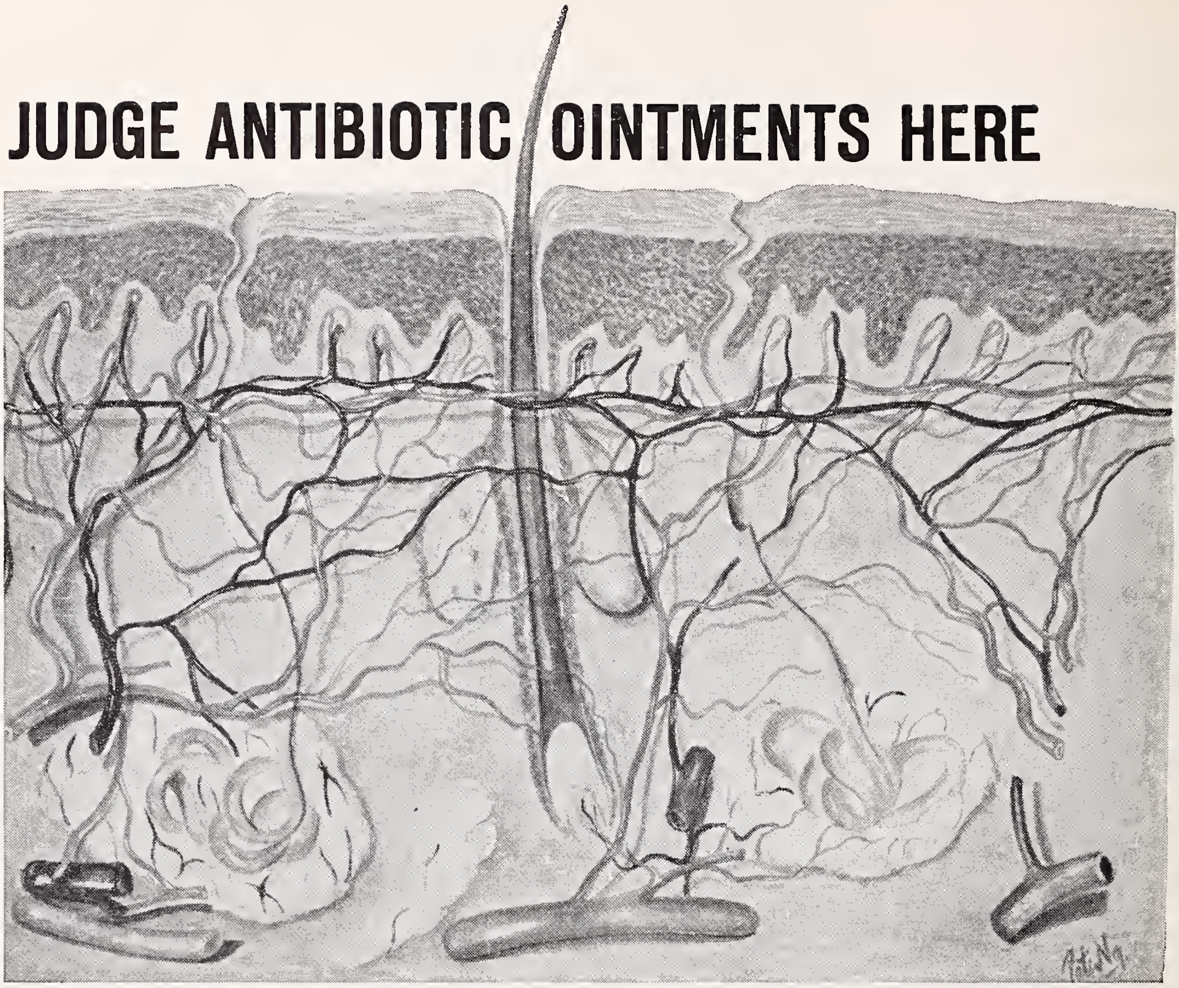

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Homo Aquaticus[1]

Jacques Yves Cousteau can be considered the father of underwater diving. His first adventure was in a New England lake when he dove to clear away sunken branches under the spring-board. But to bring the submerged scenery into focus and investigate the bottom, diving masks were needed and they did not then exist. In the mid 30's masks appeared and this made Cousteau eager to really come to grips with what is down under. The first great stride in freeing man under water for three dimensional maneuver and to liberate him from air lines to the surface, was Cousteau's invention together with Emile Gagnan an engineer, of a device called the Aqua-Lung an independent automatic compressed air diving apparatus.

It is a portable assembly of one of more bottles of compressed air harnessed to the diver's back and piped to a mouthpiece through the Cousteau-Gagnan regulator. This delivers air on a demand basis in direct response to human respiration. The regulator automatically serves the air compressed to a degree matching the pressure of the surrounding water so that the human lungs can withstand the increase as the diver goes down and the decrease as he ascends. It allows three dimensional "flights" with the essential aid of three other accoutrements —the diving mask sealing off the eyes and nose,—belt weights adjusting the body to neutral buoyancy—and rubber foot fins which were invented by another Frenchman Yves de Corlieu. This apparatus has multiplied immersion time a hundred fold, and now diving has gone beyond a sport, but has become a world-wide movement.

Cousteau and Dumas described their first decade with Aqua-Lung in "The Silent World" in 1953. It was this book and his invention of the Aqua-Lung that really set off the present boom in underwater sport. The audience became much bigger when Cousteau's feature film "The Silent World" won the Grand-Prix at the 1956 Cannes International Film Festival.

Diving now has gone beyond sport, and has become a world wide movement. Now man's curiosity is aroused by what is in the sea and what can be learned about it. Of course, to really learn something about the sea, it will be necessary to place swimmers underwater for longer periods of time than the Aqua-Lung will permit. Last autumn two men of Cousteau's diving team, Albert Falco and Claude Wesley, remained under water for a week residing in a seventeen foot cylinder, eight feet in diameter. It was supplied with air compressed to equal that of the sea outside and the men went out in the water with Aqua-Lungs to work five hours a day. This project called Continental Shelf Station No. 1 showed that men could adapt to such a life. The extended submersion afforded them observations of terrain and fish behavior denied to episodic divers. Without doubt in the future they will go longer and deeper with more people. In fact, in Cousteau's lively imagination, he envisages undersea villagers who will reside in dry gas filled houses on the bottom and live pretty much like householders ashore. They will engage in stock farming domesticating marine animals as we above water have domesticated the horse, the cow, the chicken and the pig, only he thinks instead of finned fish it might be enormous marine worms that accumulate edible protein faster than any fish! How homo aquaticus will cook them down under and eat them he does not say.

It is clear that in this conquest of the sea, man's ability to go lower than the present 50 fathoms will need a great deal of scientific experimentation! How can one prevent the water pressure from collapsing the chest? How do you stay "down under" without breathing gills instead of lungs? To be sure ever since Jules Verne and lots of people before him, man's imagination has attempted to project what is to come and sometimes it really did come to pass. It is claimed that some U. S. space medical researchers are dreaming of a device, a sort of artificial gill in a small capsule that would allow the astronaut to oxygenate his blood without breathing air. It is thought of as a sort of gill, to be fitted under the arm fitted and linked with his aorta surgically. To go these dreamers one better, Cousteau envisages making a real manfish who would inhale water instead of air such as the fish does! One can see here a blind faith in the omnipotence of science and a tendency to assume that science can make anything possible. It is clear Homo Aquaticus will not be produced without a vast increase in diving medical research!

Aside from fun and sport diving, it may open up a whole dimension for scientific exploration which may become of great practical use to mankind. Trawling for fish is quite primitive compared with what will be garnered with the use of diver-piloted nets. Then there is the possibility of submarine mining. All this means difficult work, for neither the sea nor any other unexplored area of nature can be expected to give us anything without a hard struggle and vast capital outlays. Furthermore prolonged submersion may reveal ailments that we know nothing about today.

In this issue some of the problems of SCUBA and skin diving are taken up in some detail. What is certain is, that man has an adventurous and inquisitive nature. He has gotten down much lower into the sea than he has before, and will wish to stay much longer than he can now, so that he can really learn something about the sea.

L.H.N.

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Nuclear Medicine: The Role Of Instrumentation

Improvements in medical diagnosis can be closely correlated with the invention of instruments. Ophthalmology began when Helmholtz invented the ophthalmoscope in 1851. Cardiology flourished when Mackenzie introduced the polygraph and Einthoven the electrocardiograph. Diagnosis took a long step forward with the discovery of the Roentgen ray. This pattern of development has been duplicated many times in other special areas of medicine.

Nuclear medicine began first on the therapeutic level when radiophosphorus was introduced in 1936 and soon employed successfully in the treatment of certain blood diseases. Then radioiodine (I 131) came into use to treat increased function of the thyroid gland and certain tumors of this organ. Radioactive gold was used for a while to decrease accumulation of abnormal collections of fluids in the chest and abdomen. Now Cobalt 60 and Cesium 137 are important sources of gamma rays used in radiation therapy of tumors.

Recently the therapeutic use of radioactive isotopes has been overshadowed by their diagnostic uses, but again only because of improved instrumentation. The early techniques of the gas-filled ionization chamber was not sensitive enough to detect tracer elements in patients though it was a powerful tool to study intermediate metabolism. Now a new instrument is at hand in which a thallium activated sodium iodide crystal scintillation detector is coupled to a photo multiplier tube. This has made feasible the measurement on the body surface of gamma emitting radioisotopes administered in such small amounts that they are perfectly safe. With the simultaneous development of the nuclear reactors abundant supplies or radioisotopes at reasonable cost were made available so that the smallest hospitals can now afford to establish diagnostic radioisotope laboratories.

The most important contribution of the technique of scanning for tracer substances up to the present time has been in the radioiodine uptake test for thyroid disease. Now physicians can diagnose with great accuracy increased and decreased secretion of the thyroid hormone, and exactly visualize the structure of the thyroid, whether it is the base of the tongue, in the neck, in the mediastinum or whether a malignant thyroid has mestasized generally.

Not only iodine is made radioactive, but many other elements can be made radioactive by neutron bombardment in a nuclear reactor. Once radioactive, the element can be identified by its characteristic gamma ray emission and rate of decay. Quantitative analysis is possible since the induced radioactivity is proportional to the amount of element present. Once it is determined which particular element that will concentrate in a special organ as is iodine in the thyroid gland, then it can be rendered radioactive in the nuclear reactor, administered to a patient and the particular organ studied by the "photorecorder." During the scanning procedure the patient lies under a radiation detector which is moved back and forth automatically over the area of the patients body being studied.

Liver scanning is now possible by using two types of physiological concentrating mechanisms. One, the dye rose bengal labelled with I 131, is concentrated by certain liver cells prior to its excretion into the intestines. The second depends on the ability of the reticulo-endothelial cells of the liver to concentrate particulate matter such as radioactive colloidal gold particles. By this technique Wagner[1] reports he has been able to diagnose tumors, abcesses and cysts of the liver when they could not be shown by any other techniques. Malpositions of the liver and abdominal masses of unknown types were also often identified.

One of the body's most important defense mechanisms against invasion by micro organisms is the reticulo endothelial system, comprising both fixed and circulating cells which can engulf and digest particulate matter. The radioactive colloidal gold particles mentioned above will concentrate in the whole of the reticulo-endothelial system as well as just in the liver, so that by means of the radiation detection equipment, it is possible for the first time to obtain quantitative measurements of the capacity of this system in carrying out its function of clearing the blood. This opens vast new fields in studying diseases of the blood, of acute and chronic infections as well as diseases of immune mechanisms.

Two new scanning procedures, visualization of the kidneys and spleen have been developed in the past few years. Kidney scanning is possible because they concentrate certain mercury labelled compounds for several hours after intravenous injections of these materials. Also the radiohippran renograms promise to clarify blood flow through each kidney.[1] Spleen scanning on the other hand is based on the ability of this organ to concentrate chromium 51 labelled red cells which have been first damaged by heating and then reinjected.

Scintillation scanning has been widely applied to the diagnosis of brain tumors and occasionally the scanning method has successfully shown brain tumors when other diagnostic techniques have failed.[1] Investigations are now actively underway to synthesize radiopharmaceutical compounds that will concentrate in special internal organs. We should eventually discover substances that will concentrate in the pancreas, adrenal, parathyroid and other organs. Wagner points out that it is predictable that within several years the use of the moving probe will be obsolete and that the patient's body will be viewed with a battery of miniatured detectors and amplifying systems, each measuring the radioactivity beneath it. In fact such detectors made of germanium and silicon should soon be available for insertion into the body on cardiac, ureteral and gastrointestinal catheters.

One important use of activation analysis in medical science is in detecting harmful environmental contaminants which are inevitable sequels to our way of living in an urban industrialized society. Many contaminants are already under suspicion of which one Cadmium seems especially intriguing. The Cadmium content of our bodies increases steadily with age accumulates predominantly in the kidney but also to a lesser degree in the liver, pancreas and spleen. What is it doing in these organs? Why is it that patients with malignant hypertension excrete cadmium at the rate forty times the normal? Why is cadmium elevated in patients dying of cancer as compared to patients dying of other causes? There is a mystery here which it is hoped will be solved by activation analysis.

Technical developments in nuclear medicine are proceeding at a rapid rate to dramatic achievements in the biological sciences. A new field of medicine is upon us, nuclear medicine, in which biology and nuclear physics are combined in a wonderful effort to alleviate suffering and enable man to live a longer and also a better life.

L.H.N.

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"Bias" In Laboratory Studies

When learning how to count blood cells in medical school many physicians discovered the great human tendency to "cheat" consciously or unconsciously. Our mentors insisted that the five squares used in erythrocyte counting should yield values within 10 cells of each other, or else the whole count should be repeated. The temptation to mentally squeeze a cell onto the counting line or to push it away was quite overwhelming. Apparently this sort of experience has colored the thinking of many physicians and other scientists; many articles and remarks contain sly or bold reference to the biasing effect on results when there is prior knowledge of the true or previously observed value.

How much does this bias affect ordinary laboratory tests? We were interested in this problem as it affected the Quality Control programs now widely used in clinical laboratories. The basis of these programs is the daily analysis of aliquots of pooled serum for a series of constituents. The technologists soon learn the anticipated range of results, and are aware that abnormal values will lead to repetition of all analyses, so they have an incentive toward bias. To check whether such bias existed, we introduced additional aliquots of the same pooled serum under fictitious patient names. The results clearly indicated complete lack of bias toward anticipated values.[1]

How then can one explain the common observation that known duplicate determinations almost always yield results closer to each other than randomized or unknown duplicates? We observed this familiar phenomenon in the experiments mentioned. The answer actually is simple and does not indicate bias. What it does reflect is the exact duplication of test factors such as the temperature, the reagents, the instrument, the technologist performance, etc. when two tests are done one immediately after the other, as compared to two tests of the same material done at longer random intervals.

There are a number of factors which help to assure analytic honesty. One is the understanding that exact reproducibility of values cannot be expected, and that there does exist unavoidable variation, the extent of which can be calculated for every test. Second is the complexity, the large volume and the partial or complete automation which presently characterizes most clinical laboratory testing; all of these factors make dishonesty so difficult as to be almost impossible.

R.N.B.

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Frozen Blood

The long term preservation of blood at a very low temperature in a state of hypometabolism now appears to be a reality.[1-5] In 1956 the Blood Research Laboratory was established at the U. S. Naval Hospital in Chelsea, Massachusetts under the auspices of the Department of Defense. Working in conjunction with the Protein Foundation, its purpose was to determine the feasibility and practicality of this method in a military hospital blood bank. Numerous reports have appeared describing the research and clinical use of frozen blood used primarily in the Naval Hospital but also in other hospitals in the Boston area.[7-12]

The method of long term preservation used at the U. S. Naval Hospital, Chelsea, Massachusetts was developed by Tullis and his associates.[4] The method involves the use of the Cohn-ADL fractionator, which separates erythrocytes from the plasma and other cellular elements by centrifugation. Blood is first collected in Acid-Citrate-Dextrose solution, or heparin when indicated, and passed into the centrifuge where the plasma is drawn off. Solutions containing glycerol, sodium lactate, potassium chloride, magnesium chloride and dextrose are then passed through the erythrocytes until the final cellular suspension medium has a concentration of 50 per cent glycerol. The erythrocytes thus protected against the damaging effects of freezing by the glycerol are then stored in plastic bags at −80°C. in storage cabinets. The packed units so prepared can then be stored for indefinite periods of time.

As the blood is needed days, months, or even years later, the frozen units are thawed in a 37°C. water bath for an average time of 12 minutes. The glycerol is then removed from the thawed unit by allowing the cells to flow into the spinning refrigerated centrifuge bowl and washing with deglycerolizing solutions similar to those used in the glycerolization but with decreasing concentrations of glycerol. The units of frozen erythrocytes are then resuspended in their own plasma, which was frozen as a separate unit, or in a 5 per cent albumin solution which also contains sodium chloride, potassium phosphate and glucose. This medium has been found to be preferable to plasma for a number of reasons. The thawed blood can then be handled by any blood bank and cross-matched and used as other A. C. D. units.[7]

Erythrocytes so collected and processed appear to maintain functional and metabolic characteristics similar to blood freshly collected in A. C. D. solution.[5] The studies of O'Brien and Watkins have shown that oxyhemoglobin dissociation curves plotted for blood stored up to 31 months are not significantly different on the day of thawing from blood freshly drawn in A. C. D. solutions.[9] Similar studies should be undertaken in blood so prepared, thawed and stored for varying periods following thawing since all such blood is not used immediately following thawing.

Haynes and associates took aliquots of radioactive chromium Cr_{51} tagged erythrocytes of 200 units of glycerolized and frozen units stored from one to forty-four months and infused them into healthy recipients. The *in vivo* survival of these tagged erythrocytes compared favorably with A. C. D. blood simultaneously studied. Other studies indicate that an average of 82 per cent of the original cells removed from the donor actually reach the recipient. Most of the 18 per cent loss of red cells appears to be the result of mechanical factors associated with the processing and appear to be independent of storage time.

Studies so far seem to indicate that erythrocytes so stored function in the recipient's circulation as normal viable erythrocytes. These frozen cells appear therapeutically comparable to cells stored up to 21 days at 4°C. in standard A. C. D. solution.[5] Additional *in vivo* metabolic and functional studies, however, are indicated on the fate of the erythrocytes and the suspension medium so infused.

"As of September 1, 1961, 2,250 units of frozen blood have been given to 653 patients of all ages."[11] Approximately 20 per cent of these units have been resuspended in their own plasma (A. C. D.) or heparinized plasma as whole blood and the remaining units were resuspended in the 5 per cent albumin suspension medium. This medium serves as an ideal vehicle for the red cells and also appears to function as a volume expander. These units have been used in patients with various types of medical and surgical diseases. A large number of the units of frozen blood have been used in vascular surgery and have been used extensively for extracorporeal circulation[10] where repeated large quantities of heparinized blood are required. In addition, the effects of the mechanical trauma associated with prolonged recirculation through a pump-oxygenator did not appear to be increased by glycerolization, freezing and storage.[10] Surprisingly little tissue oozing during the operative procedures and postoperative course of these patients was noted. O'Brien and associates concluded therefore that blood so processed functioned in a satisfactory manner as massive blood volume replacement during vascular surgery and extracorporeal circulation.

Of considerable interest is the fact that the bleeding problems which are sometimes encountered with massive replacement with A. C. D. blood have not been encountered with frozen blood processed in this manner in spite of the fact that such blood is completely lacking in fibrinogen, platelets and other clotting elements contained in whole blood. Also noteworthy is the fact that only a single case of homologous serum jaundice has been observed to date.

Since the buffy coat is virtually completely removed during the processing, there is a marked reduction in the incidence of non-hemolytic reactions. This blood has been used for exchange transfusions in erythroblastotic infants, idiopathic thrombocytopenia purpura and aplastic anemia with encouraging results.

Many obvious advantages of this method of long term preservation of blood present themselves. The blood so processed is safe since there is a lowered incidence of reactions and sterility is maintained throughout the processing. The elimination of outdating of blood drawn in large quantities from a donor population available only at infrequent intervals could be accomplished. The erythrocytes so stored are quite adaptable to the needs of the patient. The cells may be resuspended and used as whole blood, used as packed cells or the suspension medium may be modified and hence adjusted to meet the need of the individual patient. For example, blood may be supplied with a low potassium content for patients with renal shutdown. The method has proven its practicality since it has been shown to be able to supply a large portion of the needs of the U. S. Naval Hospital, Chelsea, Massachusetts. In addition, large quantities of blood may be stored for use in a major disaster and "rare" types may be stored indefinitely until needed.

The major disadvantages at the present time appear to be the limitation imposed by the equipment needed, the number of units that can be deglycerolized at one time, and the cost. The unit in operation at the Naval Hospital is capable of handling only two units of blood at one time. The cost as estimated by Tullis and associates has averaged $15.00 per unit of blood plus the cost of the original collection into A. C. D. solution.[12] These disadvantages should be at least partially overcome with the availability of the commercial multiple unit being made by the Arthur D. Little Co. of Cambridge, Massachusetts. If this unit proves to be as effective as the research units; and if the method is adopted by other large blood banks, the stockpiling of frozen blood will have become a reality.

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Tetanus Antitoxin

It is not difficult to appreciate the extent of suffering, time loss, anxiety and expense that may result from the use of tetanus antitoxin. Accepting the estimate of two million doses of tetanus antitoxin per year as a basis for calculation, then it has been estimated that, this practice is attended by 15-30 per cent incidence of serum sickness or 300,000 to 600,000 cases per year. This great amount of iatrogenic illness, includes also the immediate and fatal anaphylaxis which is reported to occur in about one per 100,000 serum administrations or twenty per year and death has recently been reported resulting from an intradermal injection 0.1 cc. of a 1:10 dilution of tetanus antitoxin prepared from horse serum.[3] In addition there is the serious neurological complication of serum sickness called serum neuritis, of which fortunately few cases have been reported, one recently by Bardenwerper.[1] This complication is an especially serious one since it can involve, the brain, the shoulder or leg, producing intense pain and paresthesias and even paralysis. Recovery can be delayed for as long as two years and permanent disability occurs in about 20 per cent. It is clear enough that the disadvantages to the use of tetanus antitoxin are self evident, especially since by now, large numbers of people must be sensitized either by previous injections or by contact with horses.

Although allergy testing is necessary to reduce the incidence of anaphylactic reactions, a negative preliminary test, it is generally understood, gives no information as to the possible occurrence of delayed serum reactions such as serum sickness and its complications. The size of the dose used seems also irrelevant to the incidence or severity of the complications, nor can it be assumed categorically that a negative skin or conjunctival test will not result in anaphylaxis, though it is the only safeguard against it that we can take.

Studies of tetanus usually reveal cases in which prophylaxis with tetanus antitoxin failed to prevent the disease. Bardenwerper, who has reviewed numerous reports, is convinced that adequate protection against tetanus requires a dose of 3 to 10,000 units repeated weekly until wound healing is complete. One is justified in suspecting that this is not a common procedure. Nevertheless in spite of the inadequacy of the usual prophylactic dose of 1500 units of antitoxin, only about 511 cases of tetanus per year were reported between the years 1947 and 1957, and of the reported cases there is only an indicated mortality of half or 255 per year. Can it be that 511 cases were due to insufficient antitoxin and that the two million doses yearly are for the most part given in vain?

It is difficult to unlearn a dogma and seek to reevaluate a procedure that has become standard and routine. The first stage in the reevaluation of the clinical use of horse-serum is to search for ways of reducing its use without being subjected to the charge that the prophylaxis against tetanus infection was faulty. No author is yet ready to suggest that serum sickness, anaphylactic death, or serum neuritis is a risk of a magnitude comparable to the omission of proper prophylactic tetanus antitoxin when such protection is indeed advisable. But as was stated above, proper prophylaxis is rarely used in tetanus infections, and the natural incidence of the disease is pitifully small as compared to the amount of iatrogenic diseases from horse serum. It is obvious that large numbers of prophylactic doses of horse serum are given unnecessarily. This implies that much greater discretion must be employed against using tetanus antitoxin routinely for what appears to be trivial non-penetrating wound in which careful cleansing and protection is sufficient.

Filler and Ellerback[2] present a program to avoid the indiscriminate use of tetanus antitoxin. In the patient who is immunized by previous administrations of tetanus toxoid, 0.5 cc. tetanus toxoid is given at the time of injury. If the wounds are massive and seen forty-eight hours afterwards then benzothene penicillin 1,200,000 units are added I.M. The non-immunized patient receives only local care for trivial wounds with appropriate antibiotic added if the wound is more extensive. Tetanus antitoxin 5-10,000 units is reserved for massive or extensive wounds seen late in the non-immunized patients. Active immunization with tetanus toxoid is started in all non-immunized patients.

It is obvious that what we need to prevent tetanus is for the whole population to receive tetanus toxoid. Then serum sickness and serum neuritis will be a thing of the past. Until such a time, avoiding use of antitoxin in trivial wounds especially since the usual 1500 unit dose is likely to be inadequate if tetanus bacillus has really contaminated the wound. All the antitoxin will do is to lead to serum sickness in every third case that has received it.

There are certain medico-legal implications of this problem that immediately come to mind. Serum sickness following use of tetanus antitoxin in a patient who received a wound in industry is certainly compensable. So is serum neuritis or anaphylactic death. But what about anaphylaxis at a later date in such a person who had previously been sensitized. Has not his constitution been altered by the previous use of antitoxin in a compensable wound. In an era when we are becoming entirely conscious of drug sensitivities, it is time we took a fresh look at tetanus antitoxin.

L.H.N.

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Phenacetin Nephritis

A case of renal injury from the chronic use of large doses of phenacetin was recently presented at the Grand Rounds in the New Haven Hospital. The Medical Letter 3:24 1961 analyzed the relationship. This problem has received considerable attention abroad since 1953 when Spuhler and Zollinger[1] observed many patients with chronic interstitial nephritis who gave a history of excessive intake of phenacetin containing analgesics. Fifty-five cases of chronic phenacetin abuse was reported from Switzerland[2] of whom eight already had severe uremia and four died of it. Nissin[3] reported from Denmark that in two years they observed forty-two patients with a history of heavy daily consumption of phenacetin over many years. Of these, thirty-nine had nephropathy, eighteen being in uremia and twelve who had the heaviest penacetin consumption had papillary necrosis. In reports from Sweden and Australia the story is very much the same; among those with excessive ingestion of phenacetin, about one-third will show some form of renal damage and this proportion rises to 50 per cent in those that had taken 6 Kg or more.[4–7]

Schreiner points out that phenacetin ingestion through out the world is enormous and like smoking has shown a progressive increase. Switzerland consumed 28,000 Kgms in 1950 and 46,000 Kgms in 1956. The analgesic medicine is available in grocery stores, newstands, vending machines and is regularly abused by watch makers. In the Swedish report the workers ingested it because they believed it increased their productivity. In the U.S.A. consumption of phenacetin containing tablets doubled between 1940 and 1948 and one single manufacturer has sold several billion analgesic tablets containing aspirin and caffein as well as phenacetin.

By comparison with reports from Europe, few reports of chronic phenacetin poisoning have appeared in the American literature probably because of enduring scepticism on the part of most nephrologists. The first report of chronic phenacetin poisoning in the American literature occurred in 1960 when a death was reported of a thirty-four year old housewife who over a period of five and one-half years consumed at least 3.5 Kgms of phenacetin.[9] At autopsy advanced tubular nephritis with necrotizing papillities was found, the commonest lesion in other similar cases. Lakey recorded interstitial nephritis in a forty-seven year old man who had consumed excessive amounts of a phenacetin containing analgesic mixture over a three year period. This patient gradually recovered when he stopped using the drug. Such an experience indicates recovery is possible probably occurs more often then we know and perhaps explains why only those patients come to our attention whose disease had progressed beyond the reversible stage.

The symptoms in the early course of the disease are insignificant and easily overlooked so that in the case of a patient who has some impairment of renal function but comes to the doctor for some other complaint, it is especially important that he be questioned on the use of phenacetin containing drugs. Especially is this important in a patient with pyelonephritis or necrotizing papillitis. There are however, certain features that help especially to draw the doctors attention to the possibility that phenacetin may be an inapparent cause of the renal disease. There is an absence of severe hypertension until quite late in the disease. There is only mild proteinuria. There is no edema. There is present methemoglobin and sulfhemoglobin in the blood and there may be severe acidosis.

Animal experiments have failed thus far to produce renal disease by phenacetin. This experience makes it more difficult to study the natural history of the disease as well as its pathology. Carried to the extreme it can mistakenly lead to undue caution as regards accepting a causal relationship between phenacetin and renal disease. But analogy in other areas should free us from undue caution in accepting the cause and effect relationship. Phocomelia has not been produced in animals by thalidomide but its effect upon pregnant women and their offspring is not seriously questioned. Lung cancer has not been produced in animals by smoking, but few question that in man such a relationship does exist. But because phenacetin nephritis has not been experimentally produced in animals, the manner by which it causes it in man is not clear and has been the subject of extensive experimentation.

The bulk of evidence as reviewed by Schreiner favors the view that ingestion of excessive amounts of phenacetin can cause kidney damage and the more phenacetin that is ingested, the greater likelihood of renal disease developing. He considers the following questions which have occupied the time of many investigators. Is phenacetin nephrotoxic in the sense that it has a direct biochemical effect on the cells of the renal parenchyma? Does it produce damage by increasing susceptibility to infection? Does phenacetin exert toxicity by its breakdown products? Is phenacetin nephritis related to an acute effect of phenacetin on hemoglobin which produces methemoglobin sulphhemoglobin and other oxidative products. Is phenacetin nephritis due to a contaminant, particularly acetic-4-Chloranilide which is found in larger amounts in the European than in the American manufactured phenacetin. And is this why the disease in America has been encountered less than in Europe. In a questionnaire to American Nephrologists, Schreiner discovered that only twenty-two out of seventy-four felt unequivocally that there was such a thing as phenacetin nephritis, thirty-nine never saw a case, and fifty-two answered cautiously that "perhaps" there was such an entity.

The report by Rappoport of two cases[10] and reports in Australia of several more, begin to reproduce European experience and there is reason to believe that we will hear more of phenacetin nephritis unless the widespread use of this drug is curtailed. We now have convincing evidence from a careful study by DeKornfeld et al[11] that there are no important differences between the analgesic compounds containing phenacetin and simple aspirin preparations. Furthermore, as far as gastrointestinal side effect liability is concerned, those containing phenacetin may cause a higher incidence of gastric upset than aspirin preparations. Can this be the reason why one of Rappoports patients developed an ulcer of the stomach?

Phenacetin is an old drug, but the experiences mentioned above are new. Is this due to a greater awareness of an unrecognized iatrogenic disease? Is it due to some change in its manufacture allowing a poisonous by-product to appear. Whatever the explanation, we are alerted to its nephrotoxic potential. Why use an analgesic combination which is no better than ordinary aspirin?

L.H.N.

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Antihypertensive Drugs IV: The Thiazides

Chlorothiazide (Diuril-Merck) and its congeners have been available for a sufficient number of years to demonstrate their usefulness in the management of hypertensive disease. In controlled studies, thiazide drugs alone, at the dosage level of one gram of chlorothiazide or its equivalent per day, lower the diastolic blood pressure by approximately 10 to 15 mm. Hg. In the asymptomatic patient with moderate and non-progressive hypertension (diastolic pressure 110-120) a thiazide is considered by many investigators to be the drug of choice.

The thiazides are oral diuretics which act by interfering with reabsorption of sodium—and thus of water—from the renal tubules. Potassium reabsorption also is affected, with an accompanying potassium diuresis. No direct effect is exerted on renal blood flow and glomerular function; reduced blood pressure, at least initially, results from a reduction in plasma volume and the consequent fall in cardiac output rather than from a decrease in the heightened peripheral resistance characteristic of hypertensive disease.

Severe Hypertension—In the more severely ill patient with accelerated hypertensive disease, the thiazides can be effective supplements to the more potent ganglion blocking and sympatholytic agents. It must be emphasized that in such patients, renal disease is the major factor limiting effective therapy, and that the reduction of blood volume caused by thiazides adds to the danger of decreased renal blood flow produced by the sympatholytic and ganglion blocking drugs.

In using the combination in patients with severe hypertension, Medical Letter consultants prefer to start with the thiazide. If the autonomic blocking drugs are given first it is usually necessary to readjust their dosage after the thiazide is added. The optimum dosage of a thiazide drug must be determined for each patient; because the blood pressure is so variable at constant dosage levels, and even in the absence of drugs, one should not make changes in dosage too precipitously or on the basis of a single observation.

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THE PRESIDENT'S PAGE

The Doctor And His Public Image

How often have you heard that the public image of the doctor has never been lower! Like so many of us, I've often viewed the doctor's public image with a certain amount of unease, and when the occasional indiscretion of a colleague hits the public press, and feel almost as badly as if it involved me personally. Indeed unpleasant notoriety which concerns a physician does involve all of us. So it is refreshing, occasionally, to encounter another point of view.

It was at the annual meeting, you may recall, the bronze plaque awards which it was my pleasant duty to confer on David A. Gibson of the *Hartford Times,* Thomas F. Walsh of the *Hartford Courant* and Charles J. McGill of the *Bridgeport Post, Telegram* and *Sunday Post.* I found the three gentlemen of the press at one of the tables and joined them for a short while during lunch. Inevitably, the conversation turned on medicine, medical costs, the public image of the doctor, and so on.

I asked the gentlemen whether they had any ideas on why the public image of doctors was so poor, what if anything, could be done to improve it. I was a little surprised when Mr. McGill spoke up "I think you're wrong Doctor. The public image of the doctor is better today than it has even been."

This rather blunt statement surprised me a little, and Mr. McGill went on to say "The general public loves their doctor; they trust him and they respect him. Things are much different than they were 30 years ago. You doctors are much busier today than you have ever been. One of the reasons is that the economic welfare of the public is on such a high level, that they come to you for things which in times past they would have treated at home. Not only do they come to you with less important ailments than they did in days gone by, but they come oftener in a year's time than they used to. And finally, they come to you because they trust you. When a patient comes to you today, he is sure that you can either help him in a current ailment, prevent diseases he might contract for which you have a preventive, or improve his life expectancy."

I was impressed. Naturally, I wanted to hear more. "Why is it," I asked, "that whenever the subject of the cost of medical care is discussed in the press, the impression is given that this is largely the cost of doctor bills?"

Once again the genial gentleman of the press disagreed with me. "I think you're wrong again Doctor. The public does not think your fees are too high. They think hospital costs are high, the cost of drugs high, but they also know that the cost of all goods and services are high. So they consider the cost of medical care pretty much on a level with other costs. I think you doctors are a little sensitive on the subject."

Perhaps he is right. Perhaps the constant bombardment by political pressure groups has made us a little gun shy. But whatever the pressures, and they are sure to continue—it does no harm to reappraise our situation, . . . to gain new perspectives.

Morris P. Pitock, M.D.

Clinical Problems In SCUBA And Skin Diving And Passenger Flying

Frieda G. Gray, m.d.
New Haven
Guest Editor

Introduction

Before World War II, not very many people attempted to dive below eighteen feet (the greatest depth of the average swimming pool) and flying had not become the accepted way of travel for a large part of the population. Professional divers and aircraft pilots were well aware of the medical problems involved in diving and flying but the ordinary person, even the ordinary physician, had only a sketchy knowledge of the potential hazards of both these activities. Since then, the number of people who engage in diving for pleasure and the number who use the airplane as a frequent means of transportation have grown enormously.

In 1958, it was estimated that about eleven million people in the United States were engaged in some form of diving without special breathing apparatus (skin diving), and that seventy-five thousand were diving with self-contained underwater breathing apparatus (SCUBA), and today the latter group probably numbers in the hundreds of thousands. Diving has become so popular that it is being used in rather unusual ways. Recently, in the New Haven Register, a caption over a small news item read as follows, "Under-water Pair Proves Golfers Miss Frequently." The story revealed that two youths suspected of doing some under-cover work were apprehended in a car parked near a lake on a private golf course. They were arrested and charged with larceny when the police found skin diving equipment and more than two hundred golf-balls in their car.

Family physicians are being called upon more and more to examine potential divers and evaluate their fitness for diving, and to treat them when accidents occur. In well organized instruction programs for divers under the guidance of certified instructors, such as the one sponsored by the YMCA, a special medical examination form must be completed by a physician before an individual is accepted for diving instruction. The form includes two pages of suggestions to the physician to guide him in evaluating whether, in his opinion, the individual should or should not dive. This portion of the form was extracted from an article by Dr. E. H. Lamphier and published in The New England Journal of Medicine.[1] Unfortunately, there are many people who engage in SCUBA and skin diving without having had the benefit of such a medical evaluation and without having received any instruction in diving technique and the prevention of injury and accidents.

With the increasing popularity of flying as the favored means of travel, physicians are more often being confronted with the question of whether a patient with a specific disease can travel or be transported by plane. The relatively recent and increasing use of jet passenger aircraft has added, on the one hand, the potential hazard of altered atmospheric pressures and on the other hand, a shorter travel time which may be of benefit to patients.

The M. Grant Blakeslee Memorial Program Presented on Friday, September 21, 1962 by the New Haven Heart Association in Cooperation with the Connecticut Heart Association and Yale University School of Medicine, New Haven, Connecticut.

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The two portions of the symposium, the session on skin and SCUBA diving in this issue and the session on Passenger Flying which will be presented in the July issue, are related in that most of the problems that arise in both diving and flying are the results of atmospheric pressure effects and in the fact that the patients most likely to be adversely affected by engaging in either activity are those with cardiovascular and respiratory diseases. The two are also related in a rather unexpected way. To illustrate I refer to an Associated Press release from Washington which appeared recently. "FAA cautions pilots against skin-diving. The Federal Aviation Agency has cautioned pilots against skin-diving within twenty-four hours of a planned flight. The Agency has circulated a warning that flying in pressurized air-craft within twenty-four hours after skin diving can result in decompression sickness, known as the bends." The FAA stated that the entire crew of one aircraft, flying in the late afternoon after a day of diving to depths of twenty to thirty feet, became incapacitated in flight. Fortunately, the flight engineer was able to fly the aircraft and landed safely. Twelve hours later, however, he too was stricken. Although this caution against flying after diving may now be known to pilots, how many of the thousands of individuals in this country who dive and then fly, particularly on the short week or weekend trips to southern waters, know about it?

The purpose of the Heart Association in arranging this symposium on diving and flying is to present the basic physiology, some principles to guide physicians in advising patients and to guide the physician in the management of the clinical problems which may result from these activities.

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> It is necessary to recognize that there exist scientific concepts so complete, so brilliant, so stable that they seem to be the fruit of an almost divine intuition which has sprung forth perfect, like Juno from the head of Zeus. But the deserved admiration evoked by such achievements would be considerably diminished if we could but picture the time and effort, the patience and perseverance, the trials, the corrections, even the mishaps which worked hand in hand to produce the final success, contributing almost as much to it as the genius of the investigator.
>
> —Rámon Y. Cajal, *Precepts And Counsels On Scientific Investigations.*

Problems Of The Submarine Environment

Introductory Remarks

AVERILL A. LIEBOW, M.D.
New Haven

MAN lives constantly under a variety of pressures. Among those he tends to forget is that of the atmosphere, but its weightiness can be realized when we think of it as equivalent to some 30 feet of sea water. It is particularly when he ventures under water, that man can quickly subject himself to vastly increased forces. These forces are relatively harmless when he understands their magnitude and how to cope with them. If he does not, his safety, and even his life are at risk.

Such knowledge finds important application in the escape training received by every member of the submarine service of the U. S. Navy. Knowing how to escape from a submerged vessel has utmost importance to morale, yet during such training occasional accidents have occurred.[1] Investigations prompted by these have provided some information of interest on the general physiology of diving. The training takes place in a water tower entered by means of locks at various levels from the surface. At the top there has been installed a compression chamber capable of holding several men and considerable equipment. After a lock in the tower is entered, it must be flooded to permit the ascent. At that moment the ambient pressure, including that of the atmosphere breathed by the subject, is that of the water. If the breath were to be held, or if air were otherwise to be trapped in the lung during an ascent from 100 feet, it would tend to expand by a factor of approximately three. This might very easily tear lung tissue and produce the complications of interstitial emphysema and air embolism. These are indeed suggested by the symptomatology of those who come to grief during ascent from depth. For example, mediastinal emphysema probably explains the anterior thoracic pain suffered by some persons after surfacing. In the escape training the problem is quite different from that of the "bends," since the time factors are too short for the gases to dissolve significantly in the blood.

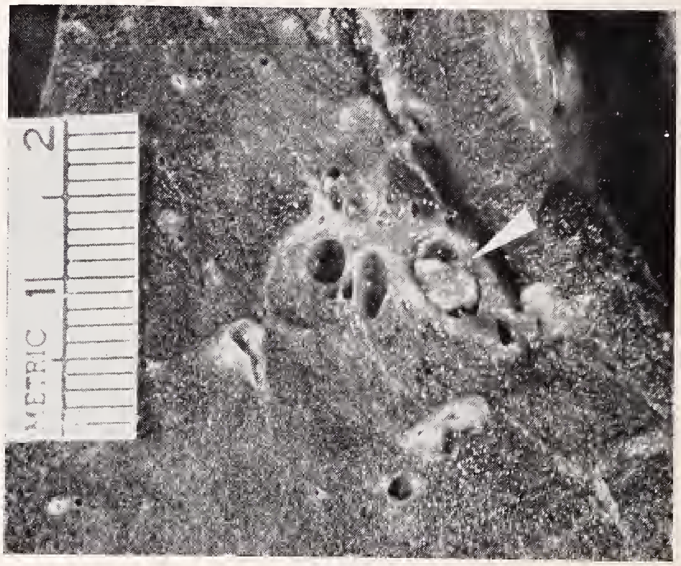

FIGURE I

Broncholith in segmental bronchus (arrow). This acted as a ball valve to trap air under pressure at the beginning of the ascent. The gases dissected into the pulmonary tissue, mediastinum, and pulmonary veins and there was widespread air embolism with involvement of the coronary and cerebral vessels. (Figs. 1-3 from Liebow et al[2]).

There has been objective confirmation of the importance of air trapping in two carefully investigated casualties of the training program at New London.[2] The first patient was a man in his twenties who lost consciousness and died immediately after ascending from 50 feet despite attempted recompression. A calcified broncholith was found in a subsegmental bronchus (Fig. I). This had

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* *Moderator of the SCUBA and Skin Diving Session of the Annual M. Grant Blakeslee Memorial Program.*

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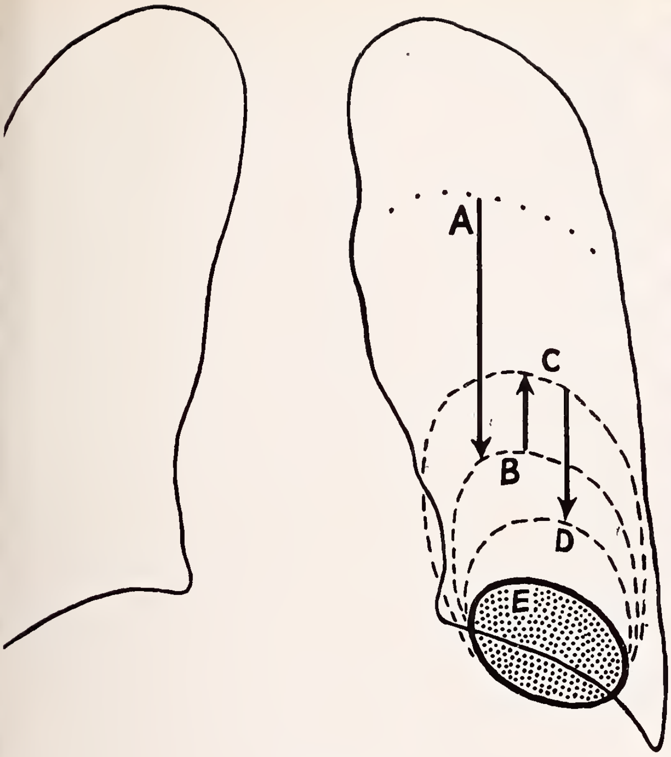

FIGURE II

Diagram representing clinical impressions of volume changes in emphysematous bulla in which air trapping had occurred. Dotted outline at (A) represents apparent size of zone of tympany at 1040 hours, about 20 minutes after recompression had been started. The bulla tended to become smaller, but several episodes of partial reexpansion were noted upon lowering the pressure in the tank. Thus, after six hours at 60 feet equivalent depth, the bulla is represented by outline (B), but immediately after decompressing the patient to 50 feet, it expanded to correspond with outline (C), then gradually shrank to a size represented by outline (D). Two similar episodes were noted upon two further successive decompressive steps, to 40 and 30 feet, respectively. The final size of the bulla just after the patient was removed from the tank is indicated at (E), which corresponds to the roentgenogram reproduced as Figure 3.

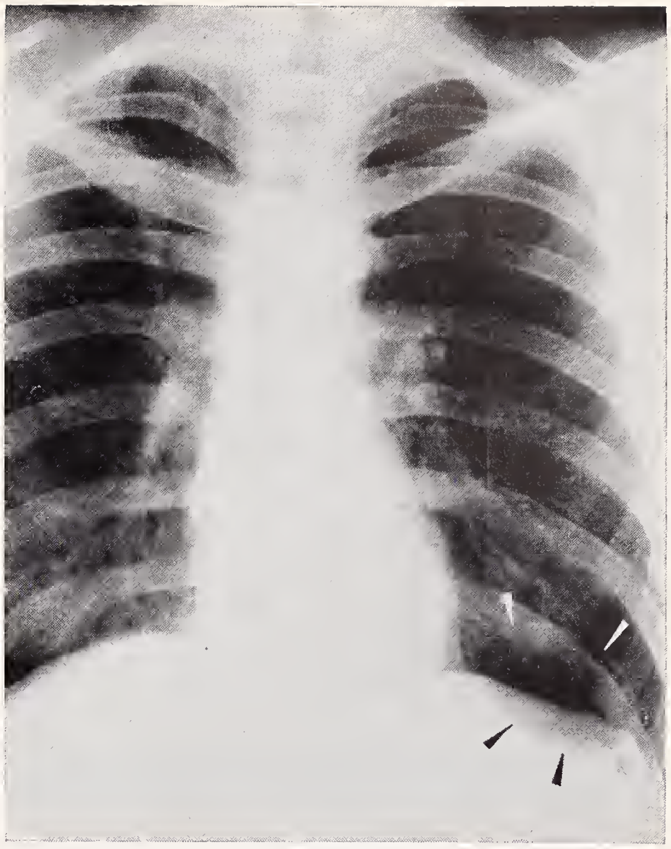

FIGURE III

Sharply outlined ovoid bulla (arrows) demonstrated in relation to the left diaphragm which appears to be locally depressed thereby. The roentgenogram was made just after completing decompression.

acted as a ball valve behind which air had become trapped. Massive interstitial emphysema and air embolism were also found at necropsy. Hilar calcifications were seen in the previous chest films that were reviewed.

In the second patient, who was also in his early twenties, the symptomatology was the same, but he survived following recompression and then slow decompression over a period of approximately 37½ hours. Here there was evidence of massive expansion of a bulla in the left lung, which became smaller upon compression and which again enlarged when the ambient pressure was reduced (Fig. II). This was established by physical examination of the patient who was under the constant care of a medical officer during the entire compression-decompression procedure. The bulla was demonstrated radiographically 20 minutes after the patient was removed from the chamber (Fig. III), but it had almost disappeared 36 hours later and by the end of one week it was no longer visible. Review of films that had been made before the accident revealed no evidence of bullous change. Both of these men had made previous ascents without complications and were under constant observation of an instructor and seemed to be following the escape doctrine faithfully when they got into difficulty. The accidents, therefore, seem to have occurred through no fault of their own.

The physical factors involved in the pathogenesis of interstitial emphysema and air embolism were investigated some 30 years ago by Polak and Adams.[3] They concluded that air embolism would occur in dogs at an intratracheal pressure of approximately 80 mm. Hg, and that this complication could be prevented by means of thoraco-abdominal binders. Their work has recently been confirmed and extended.[4] The critical factors for air embolism were established in relation to the transpleural, or perhaps more meaningfully, transatrial pressure. The former is defined as intratracheal minus intrapleural pressure and the latter

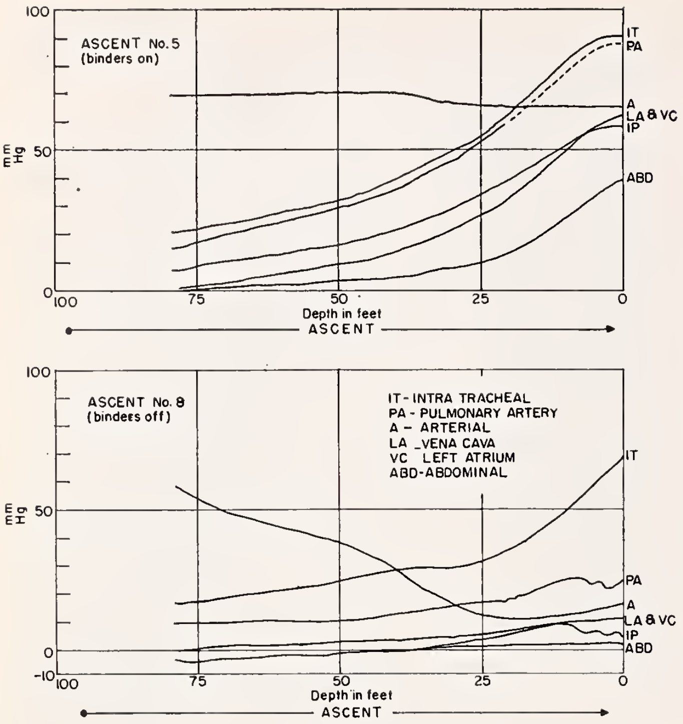

Figure IV

Thoracic and circulatory pressures in a dog during two "ascents" (decompression from 100 foot equivalent depth), with (upper chart) and without (lower chart) thoraco-abdominal binders. With the protective binders, the difference between the intratracheal and left atrial pressures was less than 30 mm Hg, and the aortic pressure was well maintained throughout the ascent. In the unprotected animal, the trans-atrial pressure was 56 mm Hg at the "surface" to the critical level for air embolism. (From Schaefer et al[4]).

as intratracheal pressure minus left atrial pressure. Transatrial pressure is a measure of the force tending to push gases from the air spaces into the pulmonary veins and atrium. Actually the transpleural and transatrial pressures tend to follow each other closely, the latter being approximately 5 mm. Hg higher than the former. The significance of the intrapleural pressure is that it becomes relatively lower in relation to intratracheal pressure the larger the lung becomes with inflation. The transpleural pressure is thus a measure of the stretch to which the lung is subjected and thus presumably of its tendency to tear. The critical values for air embolism in the dog are a transpleural pressure of 60-70 mm. Hg, and a transatrial pressure of 55-65 mm. Hg. The effect of the thoraco-abdominal binders is to keep intrapleural and intra-atrial pressures at levels much closer to the intratracheal pressure. The latter can then become exceedingly high without the critical change in the transatrial pressure (Fig. IV). In addition, the systemic arterial pressure tends to be maintained with binders on, while it falls precipitously in the unprotected animals.

It is appalling how few of the skin and SCUBA divers really understand the physiology involved. As physicians, many of us, regrettably, are hardly less ignorant, and yet we must be in a position to give sound counsel. Evidence of hilar calcification with the implied hazard of broncholithiasis, and surely evidence of obstructive emphysema would be contraindications, as would signs or history of a recent respiratory infection. Beyond this, there is a group at risk, as exemplified by the nonfatal of the two submarine casualties, in whom the existence of a hazard could probably not have been established even by means of the best available physiological methods. A major role of the physician is that he insist that those who come to him for advice are properly instructed and that he himself be in a position to assist by acquiring the necessary understanding of the equipment and of the physiological principles involved. He must also on occasion be equipped to diagnose injuries sustained in these activities and to assess their significance.

In the Foreword to the volume, "Man's Dependence on the Earthly Atmosphere," Dr. Wallace Fenn stated that man is "—on the threshold of great events in both sea and sky." The speakers in today's Symposium have contributed much to make these events possible.

Dr. Karl E. Schaefer, who is now head of the Physiology branch of the Medical Research Laboratory, U. S. Submarine Base, New London, is a graduate of Kiel University and performed research at the University of Heidelberg. During World War II, he served in the German Naval Medical Research Institute. In his post-war experience in New London, he played an important part in organizing the first Symposium on Submarine and Space Medicine, and was Editor of the Proceedings which have now been published in two volumes.

Captain George F. Bond is Officer-in-Charge of the Medical Research Laboratory at New London. His first love, after receiving his M.D. at McGill, was rural practice in North Carolina. His success in this venture is attested by his appointment to the AMA Council on Rural Health, and to a Regional Consultantship to the President's Commission on the Nation's health. In 1953, he was recalled to the U. S. Navy and served as a Submarine Medical Officer. He has held a regular commission since 1957. Captain Bond speaks from practical experience, since he is a diver himself who on several occasions has accomplished the impossible—impossible that is without a thorough understanding not only of physiology but also of practical technique. The quality of his services and achievements has been recognized and he now holds the Legion of Merit.

Dr. Arthur J. Kavanagh, Jr. was concerned with problems of Public Health even before he obtained his medical degree. He now holds degrees in Public Health from the University of Massachusetts and Harvard and an M.D. from Boston University. In his Naval Service he was assigned as Epidemiologist with Preventive Medicine Unit No. 2 at Norfolk, Virginia. It was during this assignment that he was designated to study problems of infection associated with the use of SCUBA equipment at the training station in Key West, Florida. This represents an unanticipated hazard in diving.

This Symposium should be of wide interest to civilians as well as to the military.

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. . . We must remember as Haldane has often insisted that no organ of the body works by itself or for itself . . . we must always remember that the extraordinary powers with which the heart muscle is endowed represent but the central fortress of the system and under normal conditions are protected and to a large extent prevented from coming into play by the activities of the defending positions and outposts provided by the central nervous system and its servants. It is only when these other defenses fail that the heart is called upon to display those reactions which are at once brought to light in our study of the isolated organ."

—E. K. Starling Lecture *On The Circulatory Change Associated with Exercise* J. Roy. Army M. Corps 34:258, 1920.

I made a heap of money out of literature which is remarkable for a medical man, unless he be Weir Mitchell or Osler or Holt. It happened this way—perhaps someone wishes to imitate me. Indeed, I believe he should. In 1859, E. Noeggerath and I published a big volume *Contributions To The Diseases Of Women And Children* at an expense to ourselves of $800; a few years afterwards we sold the edition as waste paper for $68.00, a clear profit—compared to nothing.

—Abraham Jacobi

Basic Physiology In SCUBA And Skin Diving

Karl E. Schaefer, M.D.
New London

Pulmonary Gas Exchange During Breathhold Dives

During the training of submarine crews in submarine escape procedures, such as "free or buoyant ascent," instructors at the escape training tank frequently hold their breath under water and perform "skin" dives to depths as great as 90 feet. The ascent is carried out by climbing up a line. These diving maneuvers are similar to those practiced by sponge and pearl divers. The escape training tank at the New London Submarine Base (Fig. I) afforded us an opportunity to study the pulmonary gas exchange during this type of diving.

Prior to the descent the diver exhaled to residual volume and then inhaled 4 liters from a spirometer. After reaching a predetermined stopping point during diving, he exhaled the major part of his expiratory volume through a mouthpiece into the first bag used for the collection of mixed expired air; he exhaled the remainder into a second bag used to collect "alveolar air." (The latter usually contained 10 to 20 per cent of the total expiratory volume.) The bags were brought to the surface. Gas samples from the bags were collected and analyzed and the volumes measured. The CO_2 and O_2 content in the lungs at various depths was calculated from the measured gas tensions and volumes of mixed expired and alveolar air, and the total dry gas pressure in the lungs. Results plotted in the O_2-CO_2 diagram show the alveolar pathways during natural breathhold dives to a 90-foot depth. (Fig. II)

Due to the increase in pressure the CO_2 tension in the lungs rose quickly above the venous CO_2 tension and a reversed CO_2 gradient developed. At 90 feet approximately 50 per cent of the pre-dive CO_2 content of the lungs had disappeared and was taken up by the blood and tissues. The influx of carbon dioxide into the lungs during ascent appeared to be rather slow and it was found possible to control the alveolar CO_2 level by the speed of ascent. If the ascent was fast the alveolar CO_2 tension attained on reaching the surface was low, between 30 and 35 mm. Hg, if the ascent was slow the alveolar CO_2 tension rose to 40-45 mm. Hg. The alveolar oxygen tension rose from control levels of 100 mm. Hg to 300 mm. Hg at 90 feet depth and fell on ascent rapidly during the last 10 feet to such low values as 25-30 mm. Hg.

The disappearance of CO_2 from the lungs during dives together with the oxygen utilization and mechanical compression of the thorax as the subject descends produce a progressive shrinkage of the total chest volume. These factors may explain the observation reported by Behnke[2] that subjects holding their breath under water increase in weight and are less buoyant.

It is reassuring to know that a diver at 90 feet is somewhat protected inasmuch as the CO_2 tension does not rise to dangerous levels and the oxygen tension is rather high. Under these conditions, breath-holding time is considerably prolonged. However, during the last part of ascent or just at the moment the diver reaches the surface, available oxygen may become so depleted as to produce anoxia. The alveolar oxygen falls to a very low level at the end of ascent from dives to 90 feet. We saw one instructor becoming confused in the moment he gave the alveolar sample after reaching the surface, but he quickly recovered after the first breath. His alveolar O_2 concentration was 3.5 per cent (pO_2 alv. 28 mm. Hg). With a very low oxygen content and a normal or below normal CO_2 concentration, the nitrogen content of the alveolar air at the end of the dive is markedly increased, 89 per cent compared with a normal 79 per cent.[1,3]

Measurements of blood gases, lactic acid, respiration and metabolism[3] made on four subjects before and after diving to 90 feet produced the following results: The CO_2 content of blood rose very slightly

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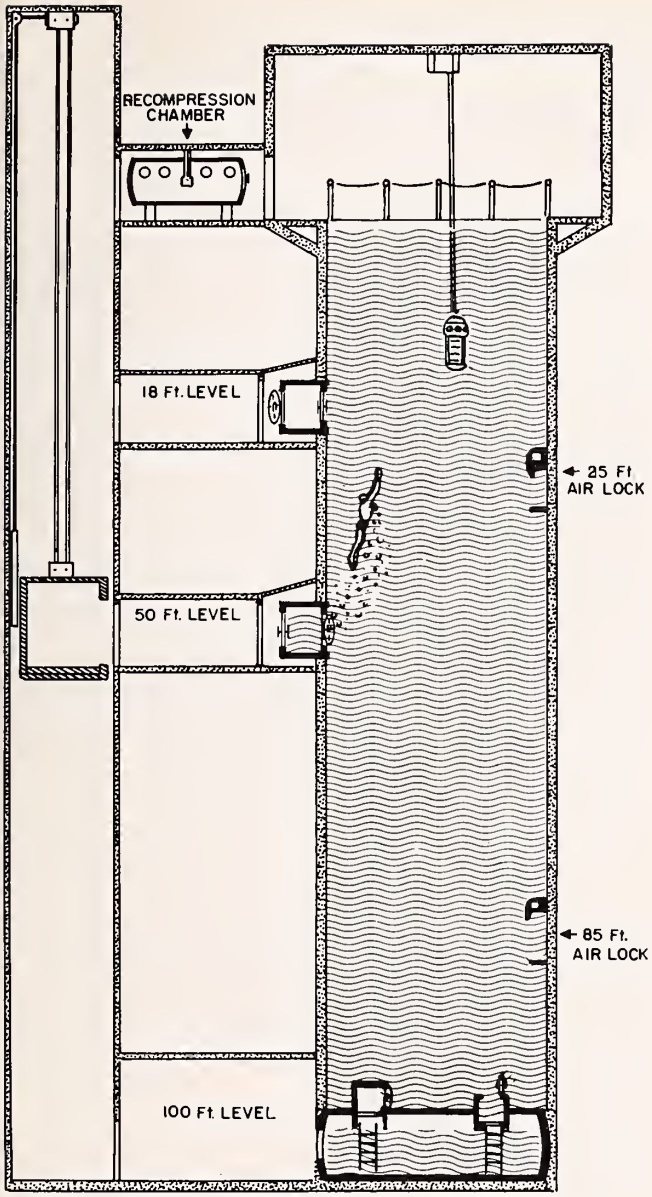

Schematic Diagram of Submarine Escape Training Tower

FIGURE I

while the oxygen content fell during the dive. The lactic acid content in the blood increased about 5-fold during the dive. In this case a sample was taken one minute after the dive. The lactic acid decreased to a level slightly above normal within five minutes. On more frequently collected venous samples, peak lactic acid concentrations were also measured after three minutes of recovery following the dive. The one minute values were consistently lower than the three minute values. This corresponds with findings recently obtained by Scholander[4] in pearl divers. The delayed but large rise in lactic acid found during the recovery phase in man, is quite similar to that observed in the seal and might according to Scholander also be interpreted as an indication of reduced muscle blood flow during the dive.

Respiration was increased 3-fold during the first minute after the dive and returned to normal level within 15 minutes. The excess oxygen uptake above the control level after the dive was limited to four minutes and averaged 1400 cc. in four subjects. This indicates that the oxygen debt taken during the dive of 1½ minutes is in the order of 1400 cc. The excess CO_2 exhalation within the first four minutes after diving averaged 900 cc.

Scholander also noted a marked diving bradycardia during active diving.[4] The pulse rate was reduced to one-half of the pre-dive value, while breathholding at the surface leads to a much smaller decrease in pulse rate. Extra systoles were noted in ECG tracings during the dive and arrhythmias and atrial fibrillation during the recovery phase. Blood pressure measurements made after breathholding under water and in air did not show significant changes in systolic and diastolic pressures.[4]

Adaptation To Diving

The breathholding time of tank instructors was found to be 105 seconds, while that of a group of laboratory personnel was 60 seconds. The vital capacity of 16 tank instructors was not only significantly larger than that of the group of 16 laboratory personnel, but it was also 20 per cent higher than could be predicted by their height, weight, and age, using the West formula.[5] Total lung

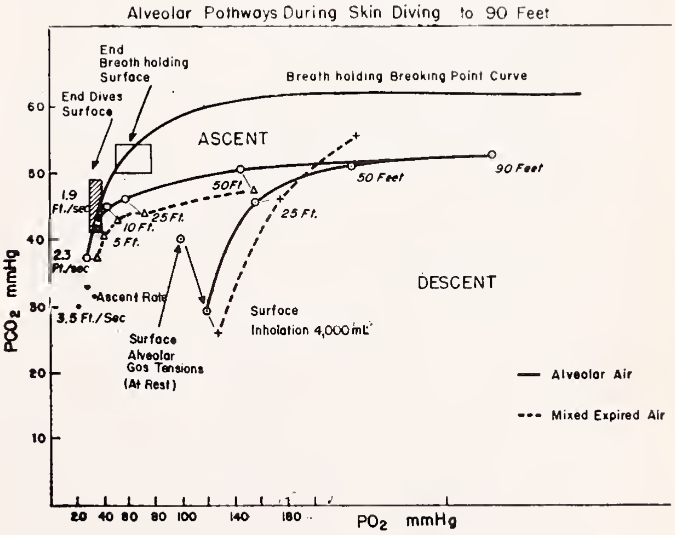

FIGURE II

Alveolar pathways during breathholding dives to 90 feet showing reversed CO_2 gradient. At 50 feet pCO_2 mixed expired air is 6 mm Hg higher than pCO_2 "alveolar air". Surface breathholding breaking point curve drawn for comparison with diving breathholding curve. End dive alveolar pO_2 decreased with increasing rate of ascent reaching 30 mm Hg at 3.5 ft/sec. End dive alveolar pO_2 fell, also, to about 30 mm Hg. From Schaefer et al[1]. Reproduced by permission of Science.

capacity, tidal volume, vital capacity and respiratory reserve were markedly increased in the tank instructor group as compared with the laboratory personnel. To decide whether the lung volumes really change during the course of duty at the tank, a longitudinal study was carried out and the lung volumes of tank instructors measured at the beginning of their tour of duty and after one year. Respiratory reserve, tidal volume, vital capacity, and total capacity showed a significant increase while residual capacity decreased. The maximum average depth a diver can reach without getting a thoracic squeeze depends on the ratio of total lung capacity to residual capacity and the volume of the airways. The observed change in this ratio results in a 20-30 foot extension in the maximum safe depth after one year of duty.

The ventilatory response to increased concentration of CO_2 and to a lowered concentration of O_2 (10.5 per cent) was found significantly decreased in instructors at the escape training tank as compared with the laboratory personnel.[3,6] The CO_2 tolerance curves were obtained by exposing subjects for 15 minutes to 3.3, 5.4 and 7.5 per cent CO_2. Alveolar ventilation and alveolar gas CO_2 tensions were determined at the end of the exposure period. The stimulus response curves (or tolerance curves) to CO_2 showed, in the case of the tank instructors, a shift to the right and a decreased slope.[3] The high tolerance to CO_2 is developed during the diving period and lost after a three-month layoff period as shown in CO_2 sensitivity tests in eight tank instructors.[7]

Blood gas and electrolyte changes observed at the end of a longer period of water work were similar to those noted during adaptation to prolonged exposure to CO_2.[8] They consisted in a decrease in pH, increase in pCO_2 and bicarbonate levels commensurate with an increase in hematocrit and a red cell cation exchange, e.g., increase in red cell sodium and decrease in red cell potassium. These adaptive changes disappeared after a three-month layoff period.[7] Furthermore, evidence of an increase in CO_2 stores, as the result of diving, was obtained in instructors following a two-year period of water work when compared with data obtained after a three-month layoff period.[9] During constant hyperventilation, lasting for one hour, more CO_2 was eliminated and the end tidal CO_2 tension was significantly elevated under the first condition. The decreased sensitivity to CO_2 and low O_2 found in skin divers represents an adaptation similar to that observed in diving animals.[10] The changes in lung volumes, consisting of an increase in total lung capacity, vital capacity and tidal volume, and decrease in residual volume, might contribute to the reduced sensitivity to CO_2 because of the relationship found between large tidal volume, small respiratory rate and low response to CO_2.[11]

Physiological Problems And Hazards Associated With Various Diving And Escape Procedures

Since the clinical problems of diving are discussed by Dr. Bond and air embolism by Dr. Liebow, I only want to mention the physiological problems associated with the hazards of diving.

All divers, whether skin, SCUBA, or deep sea, are subject to the effects of unequalized pressure differences across the air-containing structures, middle ears, sinuses, lungs, and gastro-intestinal tract (barotrauma). The skin diver is safe from air embolism but might develop a thoracic squeeze with pulmonary edema and hemorrhage if he decends to a depth at which the total air in the lung is compressed to a volume smaller than the residual air. To avoid this danger, skin diving should be limited to a 50-foot depth. The SCUBA diver, who can stay under water for a considerable time, is exposed to the same hazards as the conventional diver using helmet and suit: decompression sickness, air embolism, oxygen toxicity and nitrogen narcosis.

Submarine Escape (Free And Buoyant Ascent)

Buoyant ascent (aided by an inflated life jacket) has been successfully carried out from a depth of 300 feet, at an ascent rate of 340 feet/minute, without respiratory distress.[12] Recent evaluation of alveolar gas exchange data, obtained during buoyant ascent from 90 feet has shown that alveolar CO_2 tension can be kept at normal levels at the average ascent rates used.[13]

SCUBA Diving

Several cases of unexplained loss of consciousness occured with the use of oxygen (closed circuit) diving equipment in which canisters are employed for CO_2 removal.[14] CO_2 intoxication was implicated as the most likely cause of the "shallow water blackout." Using open or closed circuit Self Contained Under Water Breathing Apparatus (SCUBA) units at a greater depth, the direct effect of pressure produces an increased density of the breathing mixture, resulting in an increased breathing resistance. Under these conditions, the work of breathing was found increased in both the breathing apparatus and in the airways of the diver.[15,16] Pulmonary resistance at four atmospheres pressure increased twofold compared with the values at sea level.[17] Froeb[18] compared the respiratory responses to CO_2 in 16 professional divers using SCUBA equipment with those of non-divers and did not find any evidence of adaptation to CO_2 in the SCUBA divers. In studies of well trained and less trained under-water swimmers of the U. S. Navy Underwater Demolition Team, using a closed circuit oxygen breathing unit, a higher mean end tidal pCO_2 tension was found in the trained swimmers during swims at a speed of 1.1 to 18 km/hr.[19,20] While resting under water, differences in end tidal pCO_2 were negligible.

Deep Sea Diving

In deep sea diving ("Hard Hat Diving"), in which the conventional suit and helmet are used, a large amount of air has to be ventilated to prevent an accumulation of CO_2 and often, this is not fully accomplished. Moreover, at greater depths, breathing resistance becomes very marked and may easily lead to CO_2 retention. Lanphier found that a considerable number of experienced deep sea divers at the U.S.N. Experimental Diving Unit showed CO_2 retention during under water work.[21,22] The respiratory minute volume declined during work dives to moderate depth using oxygen-nitrogen mixtures. The degree of retention of carbon dioxide was related to the ventilatory response to CO_2.[23] When breathing resistance was reduced by the use of helium-oxygen mixtures, the CO_2 retention was small or absent.

A more detailed account of the physiological problems involved in diving has been given elsewhere.[24]

Summary

Studies of pulmonary gas exchange during breathhold dives to 90 feet demonstrated the existence of a reversed CO_2 gradient from the lungs into the blood during descent at the 50 foot depth. The influx of CO_2 into the lungs during ascent is regulated by the speed of ascent.

Extremely low alveolar O_2 tensions between 25-35 mm. Hg, found after surfacing from 90-foot dives, emphasize the existing danger of hypoxia. On the basis of these findings it is recommended that skindives should be limited to a 50-foot depth. Observations on metabolic changes during diving and diving bradycardia are discussed.

Adaptation to skin diving consists in: 1) increase in total lung capacity and decrease in residual volume—resulting in an extension of the safe maximum depth; 2) increased tolerance to high CO_2 and low O_2.

Hazards associated with various diving and escape procedures are discussed.

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Clinical Problems Of SCUBA Diving

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Clinical Problems Of SCUBA Diving

Since the introduction of self-contained underwater breathing apparatus (SCUBA) in the early 1950's, production and use of this diving equipment has increased at a truly fantastic rate. Although precise figures are not available, it is estimated that the number of civilian sports divers employing SCUBA gear number nearly one quarter million people in America today. Considering the physiological range covered by these sports divers, and in view of the inherent dangers of compressed-air diving, the emergence of clinical problems peculiar to SCUBA use was predictable. Because the pathology of hyperbaric exposure is so remote from commonly encountered clinical syndromes, medical practitioners are generally not prepared to cope with the accidents which result from this type of diving. In this context, a brief summary of major clinical problems of SCUBA diving may be in order.

Physical Requirements

Any approach to the medical hazards of compressed-air diving must commence with the basic, preventive question of candidate selection. Unlike the diving medical officer in the Navy, the civilian practitioner is taxed with an extremely difficult range of human beings who present themselves for medical approval relative to diving activities. At first thought, it might seem easy to eliminate all applicants who are overweight, over age, hypertensive, neurotic, or victims of chronic respiratory disorders. In civilian practice, however, the problem is not thus easily resolved. The would-be SCUBA diver will probably pursue his underwater activity, regardless of physical defects determined by examination. The physician, therefore, must accept the role of adviser, shorn of normal dictatorial powers. Enlightened advice, however, may avert casualties, and such advice is best received from the family doctor.

Evaluation of the potential SCUBA diver should probably be predicated on the likelihood that most candidates will dive regardless, and can best be served by a careful evaluation of the physical disabilities which may limit or preclude this activity. Since most diving casualties relate to abnormalities of the respiratory system, this is a prime object of surveillance. Problems relative to the middle ear and paranasal sinuses can rarely be predicted by ordinary examination. Ability of the individual to equalize pressure in these areas is probably best determined by a test of pressure, in an available chamber, or in underwater trial. In case of the lungs, however, the practitioner has better selective control. Any pulmonary lesion, such as cystic lung disease or healed extensive pulmonary histoplasmosis should be immediately and permanently disqualifying. The reason for this should be made clear to the patient: any condition which could lead to general (as in asthma) or localized trapping of air in the lungs, can result in a fatal case of arterial air embolism with a relatively minor pressure fluctuation. In addition, but of lesser importance, is the fact that impaired pulmonary function predisposes to increased carbon dioxide retention and development of decompression sickness, or "bends". Concerning the cardiovascular system, it may suffice to point out that underwater swimming with SCUBA gear is a most demanding physical exercise, comparing nicely with 440 and 880 yard competitive runs. If the candidate's cardiovascular system is inadequate for such a stress, he should be advised against SCUBA diving. Consideration of other body systems should be predicated on the simple fact that SCUBA swimming is hard work for the entire organism; the candidate should be impressed with this fact. Finally, the doctor and patient alike must

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understand that an underwater environment is both unnatural and hostile, and that any degree of emotional instability will increase the probability of dangerous accident.

Major Clinical Hazards

The major clinical hazards of SCUBA diving are threefold: arterial air embolism, bends, and drowning. Although the terminal fatal event is generally drowning, the proximate cause not infrequently can be traced to air embolism or massive and generalized bends. Because of popular confusion between bends and air embolism, it is important to describe these entities in more detail.

Air embolism occurs when massive quantities of inspired gas are forced through the alveolar cellular wall, to proceed via interstitial pathways toward the mediastinum. In this process, the gas may be forced into the pulmonary venous system, or else dissect into the loose tissues of the mediastinum. Should the gas enter the pulmonary venous system, it will pass directly to the left ventricle, and thence ultimately to the cerebral vessels, with blockage of circulation throughout the circuit. The quantities of gas which enter the circulation under these circumstances are massive, indeed. On at least one occasion, we have calculated more than one liter of air in the heart, aorta, and cerebral vessels of a fatal casualty. Treatment of air embolism consists in *immediate* recompression to a chamber depth of 165 feet, which reduces the intra-arterial gas volume by five-sixths, permitting resumption of normal blood flow. Subsequently over a period of thirty-five hours, reduction of pressure permits safe return to surface environment after the residual gases have been dissolved in the blood stream of the individual, and eliminated through the lungs.

It is unlikely that, in absence of recompression facilities, medical therapy will be of real value in treatment of an actual case of arterial gas embolism. The role of the practitioner, therefore, is that of a preventive adviser, since his judgment of potential pulmonary air trapping may be of critical importance to the diving candidate. In the event of a fatal occurrence of air embolism, however, it is vital that a meticulous autopsy be performed. Presently, SCUBA deaths are invariably labelled as drowning, and autopsies are not obtained; thus, the causal factor of air embolism is not documented. The incidence of fatal embolism cases in the Navy is fortunately small. It follows, therefore, that good information relative to this clinical entity is scarce. Additional autopsy findings which could be acquired in cases of civilian casualties would be of inestimable value in overall evaluation of the syndrome. More importantly, some estimate of the role of air embolism in SCUBA deaths might be available.

Decompression sickness, caisson disease, or "bends", represents a clinical syndrome quite distinct from arterial air embolism. As previously described, air embolism results from intra-arterial introduction of massive quantities of gas which passes through alveolar walls and terminates as emboli in the cerebral vessels. In the case of "bends", however, a different physical phenomenon is involved. The diver who breathes compressed air under increased ambient pressure will inevitably have a degree of nitrogen dissolved in his blood stream and tissues, depending on the depth and duration of the dive. Upon ascent, this inert gas must be eliminated through the lungs, or else come out of physical solution, producing gas bubbles. Such bubble formation in turn produces intravascular blockage or cellular distortion, either of which will result in tissue anoxia and pain. This pain, commonly centered in areas of poor vascularity, is the characteristic of divers' bends. Most likely sites of election are joint areas of the extremities, with rare involvement of the spinal cord.

In the treatment of "bends," as in the case of air embolism, recompression of the patient is a necessity. Because "bends" does not present a comparable hazard to life, however, a good deal of latitude is allowed in the time interval between accident and pressure treatment. Delays of several hours may be dictated by the distance to nearest recompression chamber. Such a delay will somewhat modify the therapeutic result, but it is important to emphasize that even greatly delayed treatment of bends will generally result in great improvement or total cure. If a delay is anticipated before delivery of the patient to a pressure facility, administration of opiates may be required for control of severe pain, although apparent improvement due to such drugs in no way changes the requirement for recompression treatment.

Minor Clinical Hazards

Although the practicing physician will not often be confronted with major diving accidents, his advice and treatment will frequently be sought in connection with minor casualties of everday diving. Almost invariably, these derangements will result from unequal pressure differentials in the paranasal sinuses or the middle ear. During descent in the water, external pressure on the body will increase at a rate of about one-half pound for each foot of descent. Clearly, if this pressure is not equalized in the middle ear and sinuses, an unequal pressure differential will exist. In such a case, severe pain will be experienced, and accompanied by extravasation of blood and serum into the closed cavity. Because pressure equalization during ascent is easy and automatic, relief of pain is achieved by return to the surface. The diving enthusiast now presents himself to the physician for diagnosis, treatment, and advice relative to future diving activities. The history of a recent dive, coupled with evidence of extravasated blood in the middle ear or sinuses, will make the diagnosis simple, and in practically all cases, active therapy is not required. The question of future diving activity, however, is not so simply resolved. Generally speaking, occurrence of ear or sinus squeeze at rare intervals should not be contraindication to further diving activities, and might be considered a minor occupational hazard of the sport. Persistent inability to equalize pressure, however, may permanently disqualify the subject for further pressure exposure. In selected individuals, radiation of lymphoid tissues near the eustachian ostia will ultimately permit normal equalization of the middle ear, and suitable therapy for chronic or acute sinusitis may guarantee equalization of these cavities. Generally speaking, the ability to "clear" the ears is a function of time and practice, making prognostication difficult in any event, and occasionally embarrassing.

Summary

In brief narrative, an attempt has been made to elicit major and minor clinical hazards of SCUBA diving. With the predictable increase in numbers of diving enthusiasts, physicians throughout the United States will be expected to understand and treat the pathologic results of pressure exposure. Familiarity with these syndromes will improve the effectiveness of the medical practitioner with respect to advice as well as treatment.

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However elegant and memorable, brevity can never in the nature of things do justice to all the facts of a complex situation.

—Aldous Huxley, *Brave New World Revisited.*

A SCUBA Syndrome

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IN August of 1956, an epidemiological team from U. S. Navy Preventive Medicine Unit (PMU ♯2) based at Norfolk, Virginia, was requested to investigate an outbreak of an acute febrile illness among swimming personnel at the U. S. Naval School of Underwater Swimmers (UWSS) in Key West, Florida. The UWSS is one which teaches personnel of all services to use the Self Contained Underwater Breathing Apparatus (SCUBA) and in 1956, the use of two types of SCUBA were taught in the school: (1) the Scott Hydro-pak, which features a full face mask to protect the user from contaminated waters and (2) the French Aqualung, which utilizes a mouthpiece as the link between the man and his air source. Common to these two pieces of apparatus are air tanks, regulators and hoses. The air source is the same, the regulators differ technically and the hoses differ in construction. The basic difference in design and purpose allows more intrinsic and extrinsic contamination of hoses and regulators in the French Aqualung.

The Group At Risk

In the class of August 1956, there were 33 students. Fifteen students became ill (an attack rate of 45.4 per cent) while only one of the 18 instructors became ill and he was the medical officer who had been there for a year. None of the 11 personnel of the school, not engaged in swimming, was involved.

The Illness

The onset consisted of minimal prodromal symptoms followed by sudden chills, fever, nausea, ocular and nuchal pain, severe low back pain, headache and profound anorexia. The patients looked quite ill and the initial temperature was usually 99 to 100 degrees F, but rapidly rose to 103 to 105 degrees. Two injected throats and some scattered rales or rhonchi in four cases constituted the positive physical findings. A non-productive cough was observed in 13 cases.

Hemograms revealed no anemia and white blood cell counts ranged from 6,700 to 16,900 with a median of 12,000 accompanied by a moderate predominence of young forms.

Chest x-rays usually revealed normal lung fields, but at least one was read as atypical pneumonia and several as having increased hilar markings. There was no correlation between clinical severity and the x-ray findings.

The disease ran its course in about 72 hours. The fever fell dramatically in 24 to 48 hours in all instances. Ten men were hospitalized, but there was no mortality or permanent disability.

There was a suggestion that this illness had been experienced by other swimming instructors during previous months. Students in other classes had been stricken with a similar illness, but never in numbers to cause alarm. Two members of the epidemiological team used SCUBA gear at Key West and one developed the illness.

Microbiological Studies

Serological, viral and fungal studies were negative, except for non-pathogenic fungi. Beta streptococcus was isolated from the throats of five symptomatic and four asymptomatic personnel. Five of the six French Aqualung mouthpieces and valves had a heavy growth of miscellaneous bacteria. Quantita-

We are grateful to the Medical Department of the United States Navy and to the New Haven Heart Association for this opportunity to speak on a growing potential public health problem.

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tively, much less contamination existed in the valves of the Scott Hydro-Pak.

Recommendations at this time included the use of a quatenary ammonium compound for cleaning the gear followed by a chlorine rinse.

The Interim 1956-1958

From 1956 to 1958, three different diving medical officers served at UWSS at Key West. Correspondence with PMU #2 indicated that the illness was still prevalent with a variable incidence in each new class. Ill students were no longer hospitalized and complete recovery by 72 hours was predictable.

In October of 1958, Dr. Walter Puckett, the current diving medical officer at the school, impressed by the increasing incidence and morbidity encountered in each class, requested laboratory assistance from our unit. A plan to accept serological specimens for study was evolved and Dr. Chester Emmons, Chief of Mycology at the National Institute of Health was contacted to make a fungal survey of the area.

In November of 1958, one of the students who came down with the illness progressed to a fulminating broncho-pneumonia and expired. This unit was then requested to make a field investigation of the problem. The death represented a tremendous variation from the predicted course of the disease. Five of this patient's colleagues who became ill simultaneously recovered as expected. It appeared that either a different disease process was superimposed upon the primary disease or that an unusual dose of the agent had been acquired. Retrospectively, there was no known host factor that would increase susceptibility to disease.

At autopsy, culture studies produced Pseudomonas aeruginosa and Pseudomonas geneculata, Staphyloccoccus aureus and Herellea species from the lungs. Pseudomonas geneculata was isolated from the liver and Pseudomonas ovalis was isolated from the kidney. No fungal agents were recovered. A rickettsial-like agent was recovered, but no viral agents.

Prospective Study

A new class would convene on January 5, 1959 and a team composed of an epidemiologist, bacteriologist, industrial hygienist and a sanitarian arrived in advance to be joined by Dr. Emmons.

The UWSS is located within the Key West Naval Base in a two story barracks type structure. A SCUBA storeroom in the school contains the face masks, hoses, mouthpieces and regulators. Poor drying conditions exist here in the absence of air conditioning. A surplus of equipment exists so that no two consecutive classes use the same gear—the corollary of this is that each new class receives gear that has been stored for approximately six weeks.

The Pattern Of Illness

Review of the last class of 1958 revealed a biphasic curve to the illness. Inadvertently, this class was divided into two student groups; one commencing on October 27, 1958 and the other on November 3, 1958. Ten days after each class began, the disease made its appearance. The two student groups had in common ten days of exposure to the Key West area; the first week of surface swimming and conditioning and finally, the first use of the French Aqualung. Review of the training schedule from April 1958 and the sick bay log confirmed the consistent appearance of the illness in the second week of school. Review of the training schedule and sick bay log from 1956 to April 1958 confirmed the consistent appearance of the illness in the third week of school. The sole variable during these two eras was the time of introduction to the French Aqualung. From 1956 to April 1958, this was taught in the third week and from April 1958 on, it was taught in the second week. Thus was established a temporal relationship between the use of the French Aqualung and the onset of illness. The average incubation period was 36 hours after first use of the lung.

Incidence And Prevalence

The incidence of illness ranged from 10 per cent to 75 per cent among the classes, and visitors from other units came down with the classical illness after utilizing UWSS gear. Instructors at the school seemed to be most susceptible after a prolonged leave or absence from SCUBA diving.

An intensive survey of the population in Key West and among other units on the base revealed no evidence of this illness in the general population. However, another school, Advanced Underwater Weapons, that utilized the French Aqualung reported a similar illness among its personnel.

Methods And Observations

In order to further test the relationship between the use of equipment and the onset of disease, a null hypothesis was adopted stating that there was no difference in the incidence of the disease after use of various kinds of equipment. Since the two types of SCUBA gear to be utilized were the Scott lung and the French Aqualung, the class was randomly divided into an alpha and bravo group and each group was to be introduced to their respective SCUBA gear simultaneously and then switched at a later date. Any striking correlation of disease with the use of particular equipment would enhance the consideration that this was more than a chance happening.

The day before school started, each student had a complete clinical and microbiological examination. Fifteen new arrivals to another school that would use no SCUBA gear were similarly screened to control the exposure to the new environment.

Class began on January 5th, 1959 and the illness was predicted for Friday, January 16th, 1959. Alpha group used the Scott lung and bravo group used the French Aqualung. On Friday, January 16th, 1959, about 40 hours after the use of the French Aqualung by the bravo group (18 men), two men reported ill. Their illnesses resembled that described above.

There were no other cases among the 36 members of the class, even when the Scott group switched to the French Aqualung familiarization.

The null hypothesis was neither accepted nor rejected. An exhaustive Industrial Hygiene survey had revealed no toxic gases, solvents, metals or dusts. A bacteriological survey had shown heavy contamination of the French Aqualung regulators with bacteria and fungi. It was decided to allow the next class to use the French Aqualung in the second week, as was usual, but one variable would be introduced, namely, thorough cleaning of the regulators prior to use.

The second class began on February 17th, 1959. Base line studies were obtained as before. The French Aqualung would be taught to all students in the second week of school. All French Aqualung regulators would be cleaned before use.

The illness was predicted for Friday, February 27th, 1959. On that day, a total of nine men out of twenty-five (30 per cent) reported to sick bay with the classical illness.

It was now reasonably certain that there was not only a temporal relationship between use of the Aqualung and the illness, but also a cause and effect relationship. Cleaning the regulators, however, did not prevent the recurrence of the disease.

The Search For A Cause

It had previously been determined that the compressed air coming out of the compressor, storage tanks and finally from the Aqualung tanks was exceptionally safe. However, the bacteriological safety of the air, as it came out the mouthpiece after passing through the regulator and hoses had not been evaluated. A technique was devised to sample and culture the air coming out of the mouthpiece of the French Aqualung.

A similar survey of equipment and practice was to be made at another unit (Underwater Demolition Unit #2 at Little Creek, (Va.) where no such epidemic illness had been reported.

Air samples from 30 French Aqualung regulators were sampled by a slit-sample method at Key West. The samples revealed heavy contamination of the effluent with micro-organisms. Quantitatively, bacteria dominated but there was also appreciable fungal contamination. The predominant bacterial agents were various species of Pseudomonas; of these Pseudomonas aeruginosa was most prevalent. Two species of the fungus Fusarium—oxysporum and solani were frequently isolated.

Following the sampling, the hoses and regulators were thoroughly cleaned and subsequent comparable samples were virtually sterile.

Differential sample studies confirmed that it was necessary to clean the hoses and regulators to render the effluent safe. Quantitatively, the hoses were a greater source of contamination.

Previously cleaned hoses and regulators were sampled after being stored for six weeks and heavy contamination of the effluent was revealed.

Samples from the Key West locker room area and immediate vicinity of the school revealed myriads of micro-organisms including species of Pseudomonas. Previous studies had isolated Pseudomonas species from sea water in the immediate area.

Slit samples from French Aqualung equipment being used at Little Creek, Va. (UDT #2), revealed little or no contamination without any prior cleaning. This study was done in cool weather with excellent drying conditions as opposed to the Key West conditions.

Samples from French Aqualung equipment at the Underwater Weapons School at Key West revealed moderate contamination of the effluent. Retrospectively, divers at that unit felt the illness had been prevalent in the past.

Explosive Ordinance Demolition Unit #1 at Pearl Harbor had reported a flu-like syndrome among their divers in October of 1959. Navy Preventive Medicine Unit #6 conducted a survey of equipment and samples from French Aqualung regulators which showed heavy contamination with Pseudomonas species and various fungi.

Etiologic Agents

The industrial hygiene survey conducted by Lt. Charles J. Jordan (MSC) USN was exhaustive and included dust counts; chemical analysis for potentially toxic metals; evaluation of the potential toxicity from teflon washers and detailed investigation of all potentially hazardous agents. No health hazard was identified in this survey. It was noted that the compressed air had a low moisture content and some dessicating effect on the bronchial epithelium might result with use of the French Aqualung. The Scott lung with the mask arrangement could obviate some of this dry air.

Fungal Agents

Dr. Chester W. Emmons' significant work on isolation of fungal agents from the regulator, hoses and environment, can only be briefly reviewed here. Two species of Fusarium—oxysporum and solani were frequently isolated from the equipment. Serological and skin sensitivity studies were inconclusive. The above findings make it difficult to accept these fungi as the sole agents responsible for the disease.

Viral Agents

No cytopathogenic viral agents were isolated at NAMRI or Walter Reed Institute of Research and serological studies against viral antigens were negative or inconclusive.

Rickettsial Agents

Extensive studies were done but no conclusions could be drawn.

Bacterial Agents

Pseudomonas species particularly aeruginosa, were isolated from regulators, hoses, air samples and sea water in the Key West area and from equipment at Pearl Harbor where a similar disease was observed. These organisms were also recovered from the deceased man's organs. Pseudomonads were also recovered from the Aqualung equipment used at the Advanced Underwater Weapons School at Key West. It will be recalled that UDT #2 equipment was slit-sampled during the winter of 1959 and appeared to be exceptionally clean. However, this past summer, several civilian policemen were being taught SCUBA diving by UDT #2 and one man had to borrow a UDT #2 Aqualung and after use of the gear developed the classical disease. The gear was found to be grossly contaminated with Pseudomonas aeruginosa.

Pseudomonads are ubiquitous and hardy as evidenced by their survival in sea water. With the right environmental conditions they propagate and like all gram negative enteric bacteria have a potent endotoxin associated with their somatic antigen. Invasion of the blood stream by these organisms give rise to the same symptoms as those which follow the intravenous injection of typhoid vaccine; malaise, chills, fever, headache, nausea and shock. A final answer to the cause of the illness described cannot be given here, but the Pseudomonas intoxication syndrome is most probable.

Prevention Of The Disease

The following cleaning and decontamination regimen has been successful in rendering the equipment safe and in preventing a recurrence of the disease at Key West. PHisoHex was used as the cleaning agent.

a. The regulator is broken down so as to expose the top and bottom box essemblies, both air hoses are disconnected from the box assembly and the mouthpiece tee is disconnected when feasible. All exposed parts such as the bottom box assembly, the top box assembly, the low pressure diaphragm assembly and the horseshoe assembly are to be thoroughly cleaned with a detergent and appropriate brushes. The high pressure assembly remains intact. Corroded or pitted parts should be cleaned or replaced where practicable to eliminate bacterial reservoirs. The interior of the corrugated air flow hoses are also cleaned with a detergent and brush. An Erlenmeyer flask brush is rotated in clockwise fashion to clean half of the hose and then reinserted at the other end to clean the remaining hose.

b. Following this procedure the cleaned regulator parts, hoses and mouthpiece tee are thoroughly rinsed with fresh water.

c. Decontamination of the regulator, hoses and mouthpiece tee is accomplished by immersion in a 100 PPM chlorine solution for at least two minutes. The regulator is then reassembled.

d. A final fresh water rinse is recommended just prior to use of the regulator allowing the chlorine residual to inhibit growth of organisms for as long as possible.

Considerable work has been done on assessing the critical length of time it takes for a buildup of organisms to occur in a previously cleaned regulator that is either being used or stored for a length of time. After every two weeks of use or disuse and prior to being used again, each regulator with its air hoses and mouthpieces should be subjected to cleaning and decontamination regimen. Disuse of a previously cleaned regulator is no guarantee against a buildup since a small number of residual organisms given optimum heat and moisture conditions can achieve a significant population. Whenever practicable, a regulator should be permanently assigned to one individual and a log maintained on its maintenance status. No regulator apparatus such as air hoses and mouthpiece tees should be transferable to another person's use unless subjected to the cleaning regimen prior to installation.

At this time, the Navy is introducing a semi-closed circuit SCUBA known as the Mark V. A closed circuit SCUBA known as the Drager has been in use for some time. No studies have been conducted on this equipment by this unit. In view of the increasing utilization and availability of various types of SCUBA, it is recommended that evaluation of the disease potential of other types of SCUBA be continued.

Discussion On Skin And SCUBA Diving

Frieda G. Gray, m.d., *Moderator*
New Haven

Panelists
George F. Bond, m.d., Arthuur J. Kavanagh, m.d.,
Charles W. Halverson, m.s.c., u.s.n., and
Karl E. Schaefer, m.d.

Question: "Is the female more tolerant to depths in skin-diving?" Would you care to answer that Dr. Schaefer? And, Dr. Bond would you care to comment after Dr. Schaefer?

Dr. Schaefer: A comparison has been made by Dr. Tink of the University of Buffalo. He compared the Korean males and females and found the only reason why females are diving much more than males is that they have a better heat tolerance and can stay in the water longer without losing too much heat. They are a little bit better padded. He didn't find any other difference as far as breath-holding is concerned. Unfortunately, we have not had an opportunity to study females in the depth chamber.

Dr. Gray: Do you have any comment, Dr. Bond?

Dr. Bond: Specifically, to that question, we have no data available with respect to comparative figures concerning high pressures. I understood the question to be, in other words, why don't the gals go to four hundred and fifty or five hundred feet? There seems to be no reason why they can't, but we have no definitive data on this. We have not had enough female students yet.

Question: "What do you do about the bends, if a decompression chamber is not available?"

Dr. Bond: Take the victim to the nearest decompression chamber.

Question: "About how many SCUBA fatalities occur annually?"

Dr. Bond: I'm sorry that I don't have those figures. We're attempting to set up a central clearing house with certain of the civilian agencies and hopefully, in a year's time this will be established. I wouldn't care to hazard a guess as of today.

Dr. Gray: I'm going to ask you to hazard a guess because the other portion of this question, or rather a statement which was in parenthesis reads "Devotees are prone to say they are rare."

Dr. Bond: On the contrary. I can only quote one year's statistics from California, 1956. Of all the "drowning deaths" which occurred in California, and there were many; fifty per cent of the individuals were wearing some type of SCUBA gear. You can draw your own conclusions from there.

Question: "What types of arrhythmia are seen at the end of the dive, at the time of the secondary bradycardia?"

Dr. Schaefer: I don't have enough data to answer this question. We have only a few cases and I wouldn't venture to say anything about what types occur.

Question: "Mention was made of a difference in CO_2 sensitivity and ventilation rate between tank instructors and laboratory workers. Have any studies of similar nature been made between tank instructors and highly trained athletes, such as mile runners?"

Dr. Schaefer: Cunningham has done a study in which he showed that runners actually have an increased sensitivity to CO_2. Studies also were done on SCUBA divers at the Scripps Institute, and they did not show an increased tolerance to CO_2. The conditions of SCUBA diving and skin diving are, therefore, not directly comparable to runners as far as the development of tolerance to CO_2 is concerned.

Question: "Can chronically perforated drums or chronic sinusitis be considered contra-indications to diving?"

Dr. Frieda G. Gray is Assistant Professor of Medicine, Director of Medical Clinics, Yale University School of Medicine, New Haven.

Dr. Bond: The chronically perforated ear drum, that is, a patent perforation which refuses to heal should be a contra-indication for two reasons. One, it is likely that this individual will swim in contaminated water and therefore is quite capable of developing severe mastoid disease; the second reason being that, if such an individual jumps over the side of a boat into very cold water, he will be hit with vertigo and is likely to become a casualty for that reason. Chronic sinusitis, however, is a different problem. Chronic sinusitis is the occupational disease of the diver and one may say that one may dive with chronic sinusitis and if one continues to dive with normal sinuses, one will develop a chronic sinusitis. I do not consider it to be disqualifying.

Question: "Would lung volume to residual volume ratio be helpful in evaluating candidates for diving? If so, what is a critical value?"

Dr. Schaefer: The use of the ratio of lung volume to residual volume has been proposed as a way of estimating the depths to which a skin diver can go, but the variations are so great that it is difficult to make a general statement. I don't think, at the present time, it's possible to make a definite rule.

Question: "Does the lung volume return to its normal or previous value after discontinuing diving?"

Dr. Schaefer: We have some indication that after a three months layoff period, not only the CO_2 tolerance and the blood values, but also the lung volumes would return to normal. Incidentally, we did some measurements of CO_2 stores, using the hyper-ventilation method of Fowler, and found our divers had increased CO_2 stores which returned to normal after three months, so this is all related.

Question: "Is wearing a half-suit, that is, only the top portion, dangerous? Does it affect the hemo-dynamics of circulation?"

Dr. Bond: I can only make one general comment, that wearing any type of suit is abnormal though necessary in these waters. It has been my experience that almost all wet suits are improperly tailored; they are too tight. Therefore, we have areas of compression, at the flexure of the knee and in the groin, and for this reason I prefer to have my pants pretty loose. I don't believe that leaving the pants off is practicable in these waters, I would simply recommend that they be tailored more loosely.

Question: "Are opiates effective in controlling the pain in bends? If they are, is there any contra-indication to their use?"

Dr. Bond: They are reasonably effective in the control of pain due to the bends and there is no contra-indication to their use. In fact, we do use opiates frequently in cases of delayed treatment of bends, wherein the bends have occurred six to twelve hours prior to teratment. Very frequently the application of pressure causes an increase in the pain and the results are not nearly as good as if you are able to treat within an hour or two. In those cases we do not hesitate to use opiates.

Dr. Gray: I wonder if Dr. Arthur Geiger, who has been interested in this field, has any questions, or comments.

Dr. Geiger: Since so many hundreds of thousands of people engage in diving, and my own family experience has been that the degree of ignorance is appalling and the number of risks taken by members of the family is in direct proportion to their ignorance of the physiology, I would like to ask whether diving schools might not be properly regulated so that we would know that they are qualified to give instruction and in that way know that the instructions given are safe. Members of our family have been to diving school and they know very little about intelligent diving or the risks involved. Is there any attempt at regulation?

Dr. Bond: Dr. Geiger, speaking as a Navy representative, I can't comment on national or local regulations of the clubs. This is, as you know, a matter of considerable controversy. I will say, however, that the National Association of Underwater Instructors is making a very strenuous and worthwhile effort to see to it that all of the "qualified" instructors, who are members of the N.A.U.I., do receive a sufficient amount of instruction in the physiology of diving, so that they can be relied upon. That's about as much as I can say.

Dr. Gray: I would like to call on Dr. Stephen Deschamps for his comments.

Dr. Deschamps: Following Dr. Bond's talk, I feel tempted to inquire if anyone would like to purchase, at very reasonable price, a SCUBA rig, including contaminated regulators. There's just one point that I think should be brought out with regard to the problem of shallow water blackout. There's a paper in the A.M.A. journal which reports on a number of people who survived this experience. They were interviewed very carefully, and hyper-ventilation preceding the attempted under-water swim was found to be an exceedingly important factor in the blackout. We've all made the discovery that if you breathe several times fairly deeply and rapidly, you can then hold your breath for a longer period of time. This is not due to any taking on of oxygen, but simply to a lowering of the CO_2 tension, so that it takes a longer time for the CO_2 to build up. It's been the practice of most people swimming under-water to do this and if it is not done to extremes, it is a perfectly safe procedure. In each of these cases where the victim survived or was resuscitated, they had made attempts to swim one more lap than usual, or to go for a record. In many cases they were swimmers who were using the pool alone, who had stayed, following team practice, and so forth, and who hyper-ventilated to the point of feeling a little dizzy and then made their swim. The second feature that most of the survivors reported upon was that when first feeling this stimulus to breathe, they were able to suppress this first warning of the respiratory center, and then had a feeling of a second wind, as though they could go on and on, and then the black-out came without any warning whatsoever. In fact, one victim who was observed, continued to swim for three or four strokes after the blackout and even made a turn before they realized that he had actually passed out. Hyper-ventilation is something which certainly can be overdone, and is likely to be done more often by the younger and more brash individuals. After hyper-ventilation, during the time it takes him to build up enough CO_2 to stimulate breathing, he is using up his oxygen while swimming and will become anoxic before the CO_2 has built up enough to stimulate breathing.

Dr. Gray: Thank you Dr. Deschamps. Would you care to comment, Dr. Bond?

Dr. Bond: Amen, and it's a very important point. I shouldn't have overlooked it.

Question: "I'd like to ask Dr. Kavanagh and perhaps Dr. Bond also, if it is now standard procedure, specifically in the Navy, that the gear be continuously washed and cared for as prescribed, or was the procedure peculiar to the situation you described.?"

Dr. Kavanagh: Yes, there is a bulletin which standardizes the method of care and gives instructions for cleaning and decontamination of the gear. This instruction came as a result of this investigation at Key West.

Question: "Why does such a brief exposure to diving cause an increased incidence in the susceptibility to the bends in air crews?"

Dr. Bond: I'd rather not comment specifically on the cases which were quoted. They have not been studied. However, if one dives at a depth of, say thirty-three feet, for a period of several hours, one can increase, and have a significant increase, in the nitrogen content of the body. If one stayed at that depth until saturation, one would double the amount of nitrogen in the body and thus would have about eighteen hundred cubic centimeters. If you go from that depth, and proceed immediately, shall we say to eighteen thousand feet, then you can see you would be in trouble. At six thousand feet, your differential highly favors the development of bends. In theory only, man should be able to go from thirty-three feet to about four thousand with absolutely no danger of bends. However, I would point out that after saturating individuals, we have had bends from a depth of thirty-six feet coming to the surface—so you can see that going from thirty-three feet to six thousand, in a susceptible individual, could produce it.

Question: "The question is related to treating the bends when no decompression chamber is available. The speaker pointed out the increase in pressure within the suit enwrapping the individual; could this be used when other means of compression are not available?"

Dr. Bond: The strongest suit that we know of, the full-pressure suit, will only take twelve pounds per square inch, which is about twenty-six feet of depth. In our opinion this would be only a temporary measure, awaiting transport of the victim to the decompression chamber. We do not, in general, feel that simple compression to this depth alone would ordinarily be a useful treatment. Now, the question always arises—what about putting the victim back down to a depth of relief and carrying a succession of bottles down to him. This has been done and perhaps it has been done successfully a few times, but I think the hazards of this are rather great in these cold waters. I don't think many people want to stay submerged for six hours in the Sound out there, getting a succession of bottles. I, personally, if it's just pains of the bends, would rather be transported to a chamber. I brought up this question about the full pressure suit because there was a report of a successful treatment of a case of "bends" with this method. I personally have reason to suspect that this might not have been a case of bends. I'm speaking personally now, not on behalf of the Navy.

Question: "Is there a good medical reference for general use on the subject of SCUBA diving and skin diving?"

Dr. Bond: Yes, an excellent document is "Submarine Medicine Practice." It is NAVMED P-5054, available from the Superintendent of Documents, Washington 25, D. C. The price is $2.00 and it's worth a hundred dollars.

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What's Sauce For The Goose . . .

The other day, an obviously upset member of the Society stormed into our office unannounced and threw a sheaf of official-looking papers down on our desk. "Take a squint at those — if you've got a strong stomach!" he demanded, without further ado.

We examined the *dossier* with reasonable care and found (in essence) that his statement of claim on a government agency for the medical care of one of its wards had been disallowed and that, through the medium of a series of red-pencil notations, the good doctor had been "informed" by a claims clerk that he would have to be satisfied with only one-fourth of the amount indicated on his statement.

"How do you like that?" he asked us, flushing with indignation, "Five house calls, three office visits, suture of a nasty laceration on the leg and control of diabetes—and they tell me eight dollars is supposed to cover the whole works! And this isn't the only case—it happens half the time!"

"It *does* seem a little unfair, the way you describe the circumstances" we sympathized, guardedly, "But you know how those government regulations are! What do you want us to do about it?"

"Do about it?" he thundered, "I don't want you to *do* anything! Throw it in your wastebasket, if you like—that's what I usually do! I just wanted you to know what we practitioners have to put up with, that's all. We're only too glad to take care of these poor people for nothing, but when the government says it's going to *pay* us for treating them, I don't think we should have to stand for being insulted like this!" And with that, he stomped out of our *sanctum sanctorum* and headed back (we assume) to his daily rounds.

In retrospect, we guessed we really hadn't done a great deal to make him less unhappy about the way the welfare ball seemed to be bouncing for him. But at least (we thought to ourself) we had tried our best not to say anything which would have added to his injured sense of justice. For instance, we could have told him that the General Assembly had pretty much made up its mind to require the state to pay all the service workers it employs—electricians, carpenters, plumbers, etc.—the same wages as are the "going rates" in private businesses. We *could* have told him about that, of course, but somehow we're sort of glad we didn't. We always hate so to see a grown man cry.

W.R.R.

It's So Hard To Say No

Seems as if every time we look at the newspaper nowadays someone at local, state or national level is telling us that if we won't go along with higher taxes—and, especially, if we want taxes *decreased!* —we might just as well face up to the fact that government is going to have to cut down on some of the "essential services" it's been giving us or is planning to. "And," they almost always ask, "you don't want *that* to happen, do you?"

The easiest answer to give to this recurring question—and the one apparently expected of us—is that of course we don't. "Millions for defense," we're prompted to cry out, "but not one cent for tribute!" And right there is where we may be making just a bit of a mistake. It seems that "tribute" may not be so much what's padding up the armed services budget these days as it is things like turning out ice cream, running seaside resorts, operating bars and grills, and even manufacturing ladies' underwear. All mighty nice to have on hand, of course, but are they really essential to defending the nation against Communist aggression?

And then, too, there's the farm situation. We all know how important it is to be assured of a constant supply of nourishing food, and it's not for us to say that such assurance could perhaps be purchased this year for less than the anticipated $7.7 billion of our tax money. But when we read that Secretary Freeman recently loaned $17,500 to one farmer to build himself a golf course and $2,500 to another to set himself up a quail shooting gallery, we can't help but wonder a little as to how things like that are going to ward off national starvation, either now or in the future.

It's hard, all right, to say "no" to our leaders when they ask if we don't want them to keep up essential services like the public schools or the post office or the Strategic Air Command. But we happen to like to buy our ice cream at Howard Johnson's—they have so *darned* many delicious flavors to choose from, and we doubt if we'll ever have the time or inclination to travel out to wherever that agricultural quail shooting gallery is going to be located. So once in a while, anyway, it seems to us that we wouldn't stand to lose a great deal if the government did cut out a few of its services here and there and stuck a little closer to its knitting. Like, say, giving back the job of designing unmentionables for the weaker sex to the people who make their living doing just that—and so well!—and getting on with the task of landing a man on the moon, or whatever the latest *really* essential project is said to be.

W.R.R.

COUNCIL MEETING

Wednesday, April 17, 1963

I. Attendance

Present, in addition to Dr. Gilman, the Chairman, were: Drs. Deming, Pitock, Hess, Weise, Sr., Gardner, Scully, Bradley, Grendon, Grant, Davis, Murray, Jr., Dean, Weber, Gevalt, Egan, Abbot, H. Caplan, Phillips, Hastings. Also present were: Mrs. Lindquist, Dr. Richards. Absent were: Drs. Goldberg, Cullen, Wilson, O'Connor, Cornwell, Hughes, Chartier, Martin, White, Beardsley.

II. Routine Business

Approval Of Minutes

It was VOTED to approve the minutes of the meeting of Thursday, March 21, 1963, as printed and distributed.

Life Membership

It was VOTED to approve applications for Life Membership for eligible Active Members as follows:

Richard C. Buckley, West Hartford
James C. Carroll, Hartford
Herbert R. Edwards, New Haven
Frank S. Jones, Hartford
Myron M. Radom, Hartford

Dues—New Haven Taxpayers Research Council, Inc.

It was VOTED to pay 1963 dues to the NHTRC, Inc. in the amount of $25.00.

Date Of Next Meeting

It was announced by the Chairman that the next regular meeting of the Council would be called by the President "as soon as possible after the Annual Meeting of the House of Delegates" on April 30, 1963. (Bylaws: Article VII, Section 5, par. 1).

III. Old, New And Special Business

Resolutions—AMA House Of Delegates

It was VOTED that Drs. Weise, Sr. and Gardner prepare a suitable resolution or resolutions on intern quotas and North American vs. foreign graduate intern requirements and, with the assistance of the General Manager's office, transmit copies of the resolution (s) to the AMA before April 25 and to the Delegates of other State Medical Societies as information. It is understood that all Connecticut AMA Delegates and Alternates will also receive copies of the resolution (s) prepared by Drs. Weise and Gardner.

The sense of the resolution (s) will be derived from past actions of the Council on the subject matter, and from a communication on the subject matter from the Middlesex Memorial Hospital.

Request—AMA Department On Medicine And Religion

Dealing with a request of the AMA Department on Medicine and Religion that the Society and its component county associations appoint committees to undertake liaison studies and educational programs jointly with representatives of the clergies of the major faiths, it was VOTED to refer this request to the Public Relations Division for study and report to the Council.

Meeting—AMA Committee On Osteopathy And Medicine

It was VOTED to request two Alternate AMA Delegates, Max Caplan, Meriden, and Stewart P. Seigle, Hartford, to attend a breakfast meeting of the AMA Committee on Osteopathy and Medicine to be held at Atlantic City on June 19, 1963. The meeting is to take place from 7:30 to 9:00 A.M. on that day, at the Traymore Hotel. The two representatives of the Society are asked to file a report to the Council on their attendance.

Communication—AMA Council On Medical Service

It was VOTED to receive as information notice from the AMA Council on Medical Service that William H. Horton, New Haven, has the AMA Council's gratitude "for the work Dr. Horton is doing for medicine and wants (the Society's) members to know about his contributions." Dr. Horton is serving as a consultant to that AMA body.

Board Of Examiners Of Hypertrichologists

It was VOTED to recommend incumbents Ellwood C. Weise, Sr., Bridgeport, and Reginald E. Gillson, New Haven, for appointment to the Board of Examiners of Hypertrichologists for additional terms of three years, commencing July 1, 1963.

Congress On Medical Education

It was VOTED to accept with commendation the report of C. Louis Fincke, Stamford, on his recent attendance at the Congress on Medical Education, held in Chicago on February 2-5, 1963. In compliance with Dr. Fincke's "trust that the matters brought up for discussion (at the Congress) will be disseminated throughout the State," the Report will be submitted to the Editor of CONNECTICUT MEDICINE for possible publication of such portions of the Report as he may feel are of general interest. Copies will also be sent to all members of the Committee on Medical Education and Licensure as information.

Communication—Advisory Committee To State Commissioners Of Welfare, Finance And Control

In response to a request from the Advisory Committee that the Council determine what physicians may be classified as "specialists" in the use of radioactive isotopes, it was VOTED (on the advice of Dr. Grendon, radiologist) that the Council's opinion in this matter shall be: That any licensed physician who has also been licensed by the Atomic Energy Commission to use such isotopes for treatment shall be considered to be a specialist in their use for treatment.

Communication—Connecticut Hospital Association

It was VOTED to accept an invitation received from Mr. Stuart W. Knox, Executive Director of the CHA, which suggested that a joint meeting between representatives of CHA and of the Society might prove fruitful in bringing certain matters relating to physician-hospital relationships into "sharper focus." It was further VOTED to authorize the Council's Ad Hoc Committee to Study and Report on the Corporate Practice of Medicine (David A. Grendon, Chairman) to meet with such representatives of CHA at a mutually agreeable time, and to express the hope that, eventually, a broad spectrum of physician-hospital relationships could be explored jointly by Dr. Grendon's Committee and others.

Connecticut Medical Service, Inc.

Having received notice from the President of CMS, Inc. that three of the Council's nominees had again "failed of election" as Corporators by vote of the incumbent CMS Corporators on April 4, and having examined a document received from CMS, Inc. titled: "A Statement by the Corporators, CMS, Inc., April 4, 1963," it was VOTED, without dissent, to adopt the following motion:

"IT IS MOVED: That the Chairman be directed to appoint an ad hoc committee of five members of the Council and the General Manager, such committee to proceed without delay to:

(1) Select and engage qualified legal counsel

(2) To obtain from such counsel a definition of the legal rights of the Council of the Connecticut State Medical Society with respect to nominating Participating Physicians to the CMS Corporators for election as Corporators (Directors).

(3) To retain such counsel to advise the Council its immediate dealings with the Corporators of CMS, Inc., and to furnish other legal services which may be required as a consequence of these dealings, and it is further

MOVED: That a document herewith presented, titled: "A Statement by the Council, The Connecticut State Medical Society, Inc., April 17, 1963" be adopted by the Council and be transmitted to the Corporators of CMS, Inc. as an official communication from the Council.

The Chairman appointed the following committee:

David A. Grendon, Chairman, Frank K. Abbot, Michael A. Dean, Stevens J. Martin, Nicholas T. Phillips, and William R. Richards.

The "Statement by the Council," referred to in the second part of the motion, was read in full by the member introducing the motion and was adopted without change. In essence, the document outlined a number of concepts of the Council relative to the operation of CMS, some of these concepts being in agreement with those of the Corporators and some not. In its concluding paragraphs, the "Statement" informed the Corporators that the Council felt that certain legal questions relating to the Council's function of nominating physician Directors required legal answers, and invited the Corporators to hold a joint meeting with the Council at which the legal questions might be discussed by attorneys representing each party.

It was understood that the Chairman would write a suitable reply to Mr. Coolidge's letter of April 11, and that a copy of that reply would accompany sufficient copies of the Council's "Statement" to be distributed to the Corporators.

Progress Report—Committee On Preliminary Study Of Censorship Questions

Ellwood C. Weise, Sr., Bridgeport, reported on the progress his Committee was making toward holding appeal hearings on two censorship questions assigned to the Committee by the Council on March 21, 1963. Dr. Weise's progress report was accepted. It was VOTED to authorize the Committee to consult with legal counsel (Wiggin and Dana, New Haven) on general matters relating to committee procedure (Dr. Weise-Mr. Robert B. Snow, Jr., March 27, 1963), and it was further VOTED to make available to the committee additional legal counsel from Wiggin and Dana, if and as needed in carrying out its functions.

Final Report—Ad Hoc Committee To Formulate Third Party Policy

Having received a document representing the final report of this Committee, and having VOTED to amend the Report in several of its sections, it was VOTED to adopt the Report, as amended, and to transmit it to the House of Delegates on April 30 as a Report of the Council for consideration and adoption by the House. Finally, it was VOTED to discharge the Ad Hoc Committee with the thanks and commendation of the Council.

Report—Committee To Study And Revise Bylaws

Acting on several recommendations reported to it by the Committee, the Council VOTED as follows:

(1) Adopted a proposed change in the Bylaws for filing at the next meeting of the House of Delegates. The proposed change is: To add a new section to Article IV—"Membership" which reads as follows:

"Section 7. Discipline—The Council shall have the power to discipline a member for cause by a two-thirds vote of the members present and voting at any regular or special meeting of the Council called for this purpose. At this meeting, the accused member shall have the right to be present and be represented by legal counsel. In its discretion, the Council may evoke, for cause, the following disciplinary measures against a member:

> (a) *Reprimand*—The privileges of a reprimanded individual suffer no cnange in status.
>
> (b) Suspension—A suspended member remains a member of the Society. However, for the period of suspension, he shall lose two privileges only; namely, the right to vote and to hold office.
>
> (c) Expulsion—An expelled physician immediately loses all privileges of, and obligations to, the Society. The secretary shall remove his name from the roster of members. After a lapse of one year this physician may apply for membership.

(2) To adopt as the Council's interpretation of Article IV, Section 4—"Life Members," without change in the Bylaws, that a member of the Society who has applied for Life Membership, and whose application has been approved by the Council, shall be expected to pay dues in the year of his sixty-fifth birthday anniversary or the year in which he became totally disabled, and shall become a Life Member and exempt from payment of further dues on January 1st of the year following approval of his application by the Council. Further, that this interpretation of the Bylaws pertaining to Life Membership become effective immediately after adjournment of this meeting of the Council, April 17, 1963.

N.B.: *The foregoing is a summary of the proceedings and actions of the Council on April 17, 1963. Detailed minutes of the meeting are on file at 160 St. Ronan Street, New Haven, for perusal by any interested member of the Society.*

COUNCIL MINUTES

Tuesday, April 30, 1963

I. Attendance

Present in addition to Dr. Gilman, the Chairman, were: Drs. Deming, Pitock, Goldberg, Hess, Weise, Sr., Gardner, Scully, Wilson, O'Connor, Bradley, Cornwell, Grendon, Grant, Davis, Hughes, Dean, Martin, Gevalt, Egan, Abbot, H. Caplan, Phillips. Also present: Mr. Grant Nickerson, Dr. W. R. Richards. Absent were: Drs. Cullen, Murray, Jr., Chartier, Weber, White, Hastings, Beardsley.

II. Business

Connecticut Medical Service, Inc.

The meeting had been called by the Chairman for the following purposes: (a) to receive the report and recommendations of the Ad Hoc Committee on Legal Counsel re CMS Bylaws; (b) to discuss the questions at issue with legal counsel (Mr. Nickerson); and (c) to determine what report and recommendations were to be made by the Council to the House of Delegates on the matter of the rejection of three nominees of the Council for CMS directorships by the Corporators of CMS, Inc.

Dr. Gilman read a letter from CMS President John Coolidge, dated April 26, in which it was stated that the Corporators "do not believe that a mutually acceptable resolution (of the impasse) can be arrived at by such a meeting (full Board with full Council) as the Council suggests"; that "if the House of Delegates takes formal action to accept the CMS statement of April 4 as a working basis for . . . future relationship (between CMS and CSMS), we will be pleased to receive new nominations (for three directors)."; and that "if not, it will be necessary to request a joint meeting of the Liaison Committees . . . to accord the Society 'prior review of . . . any proposed major change in the Corporation's Bylaws', if it should appear that such changes are required in order to elect a full complement of Corporators and to permit the organization of the Board of Directors."

Dr. Grendon, Chairman of the Ad Hoc Committee, announced that the Committee had engaged Mr. Grant Nickerson of the firm of Wiggin and Dana, New Haven, as legal counsel in this matter, and then read a Report prepared by Mr. Nickerson on a lengthy discussion he had held with Mr. Donald Keefe, legal counsel for CMS, Inc. Following this, Mr. Nickerson answered various questions put to him by members of the Council.

Following a full discussion of all known aspects of the situation, and consideration of all information available to the Council on the subject matter, it was VOTED (without dissent) to adopt a Resolution and to transmit the Resolution to the House later that day (April 30) with the recommendation that the Resolution be adopted by the House. The text of the Resolution* follows:

WHEREAS: An impasse appears to have been reached between the Council of the Connecticut State Medical Society, Inc. and the Corporators of Connecticut Medical Service, Inc. concerning the election of three of the Council's nominees for CMS physician directorships, and

WHEREAS: The Council's prerogative to obtain the resignation (recall) of an incumbent physician CMS Director may be exercised only "for stated cause", and

WHEREAS: The CMS Corporators, in "failing to elect" three of the Council's nominees refuse to indicate any cause, stated or otherwise, in explanation of such action, and

WHEREAS: In failing to elect, on this first occasion, three *specific* qualified nominees of the Council who are all of proven medical competence, of excellent professional reputation, are Participating Physicians in CMS and members in good standing in the Connecticut State Medical Society, the Corporators are thereby jeopardizing the rights of *all* qualified members of the Society who may be nominated by the Council subsequently to represent the medical profession on the Board of Directors of CMS, Inc., therefore be it

RESOLVED: That the House of Delegates of the Connecticut State Medical Society support the Council in its determination to defend the rights of all qualified members of the Society to be nominated by the Council to serve as representatives of the medical profession on the Board of Directors of CMS, Inc., and be it further

RESOLVED: That the House of Delegates of the Connecticut State Medical Society authorize the Council to initiate appropriate legal action, if necessary, to compel the Corporators of CMS, Inc. to seat as CMS Directors the three nominees of the Council in question.

It was further VOTED to request the Speaker of the House to call for a vote of the House to sit in "closed session" when the report and recommendations of the Council in this matter were presented to the House by the Chairman, Dr. Gilman.

There being no other business to come before the meeting, it was VOTED to adjourn at approximately 10:15 A.M.

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* *Adopted by the House of Delegates, April 30, 1963, by a vote of 71-16.*

NEW MEMBERS

FAIRFIELD COUNTY

Saul Asken, Stratford
Bohador Badan, Danbury
Daniel W. Benninghoff, Greenwich
Victoria E. Blank, Bridgeport
Lawrence M. Blum, Fairfield
Lajos A. Borsos, Bridgeport
Philip F. Corso, Bridgeport
Martin H. Flock, Norwalk
Nicholas G. Georgakis, South Norwalk
Richard A. Kenworthy, New Canaan
Allen R. Koenig, Greenwich
Thomas E. Liptak, Bridgeport
Edith A. Mittell, West Redding
Daniel L. Saraczynski, Bridgeport
Dominic V. Sorge, Bridgeport
Charles Stabinsky, Norwalk
Carlos T. Suarez, Danbury
Peter M. Tillotson, Greenwich
Jaroslav Turkalo, Wilton

HARTFORD COUNTY

Raymond C. Bartlett, Hartford
Stanley Brovender, Southington
Leo Charendoff, Manchester
Richard W. Fenaughty, New Britain
Egidio Giarnella, Hartford
Philip H. Goldman, Hartford
Martin F. Ill, New Britain
Alois Kallfelz, Hartford
Dwight J. Kresge, Windsor Locks
Joseph J. Lucas, West Hartford
Frederick T. Mauck, Farmington
Vittorio Mirabelli, Bristol
Robert E. Rentz, West Hartford
Carmelo G. Russo, Hartford
John H. Sayers, Hartford
Richard C. Shaw, Hartford
Christopher S. Speer, Hartford
John J. Stavola, Hartford
Richard M. Stockwell, Farmington
James Tauber, Rocky Hill
Joseph A. Vance, III, Bloomfield
Jack L. Westcott, Hartford

LITCHFIELD COUNTY

Patrick Beirne, New Milford
Julian A. Estrada, New Milford
Harry H. Mark, New Haven

MIDDLESEX COUNTY

Henry A. Adams, Middletown
Cyril P. Ceulemans, Middletown
John A. Dooley, Middletown
J. Trevor Lindo, Middletown
Donald McKay, Middletown

New Haven County
William R. Adams, New Haven
Ynocencio R. Balmaseda, New Haven
Marianne A. Beatrice, New Haven
John M. Brogden, Guilford
Robert E. Brubaker, New Haven
Paul R. Bruch, Southbury
Theodore P. Corsaro, Milford
John M. Davis, New Haven
Bartolomeo De Petrillo, Waterbury
John P. Elser, Naugatuck
Jerome K. Freedman, New Haven
George W. Greenman, New Haven
Arnold A. Heiger, Hamden
Gilbert W. Heublein, Hartford
Nathan G. Kase, New Haven
Melvin B. Laubstein, New Haven
Catherine O. Marsh, Hartford
Osvaldo N. Re, New Haven
Rafi Tofig, New Haven
Ely C. Wagshul, Meriden
Edward M. Wakeman, New Haven
Ulrich H. Weil, New Haven

New London County
David M. Peterson, New London

Windham County
Melvin J. Sandler, Willimantic

PLACEMENT WANTED

The Society's Placement Service is in receipt of the following:

Arthur Rubin, Age 32—M.D. Tufts Medical School 1957. Specialty Internal Medicine. Interested in association with another internist (s) or group practice.

Alan Yudell, Age 29—M.D. State University of New York. Interested in Internal Medicine and Neurology.

Benjamin N. Branch, Age 31—M.D. Harvard Medical School 1956. Interested in female urology.

Internist, Age 31—M.D. New York University College of Medicine 1956. Interested in association with another internist or group practice.

PLACEMENT OPPORTUNITIES

WANTED:

General Practitioner in Fairfield County.

Urgent need for physician in Windham County.

ENT Specialist to take over practice of physician who passed away. Litchfield County.

ANYONE INTERESTED IN THE ABOVE IS ASKED TO COMMUNICATE WITH THE GENERAL MANAGER'S OFFICE, 160 ST. RONAN STREET, NEW HAVEN.

1963 MEETINGS

June 5—Section on Internal Medicine—Organization Meeting to be held Wednesday, June 5th at 4:30 P.M. at the Stratford Motor Inn, Route 110, Stratford, Connecticut.

June 16-20 — American Medical Association, Annual Meeting to be held in Atlantic City.

September 27—38th Connecticut Clinical Congress to be held at the Yale-New Haven Medical Center.

December 4—Annual Meeting of the Connecticut Society of American Board Surgeons, Inc.

1964 MEETINGS

June 14-19—The VII Interamerican Congress of Cardiology will be held in Montreal, Canada.

Duke University's Ninth Seminar Cruise

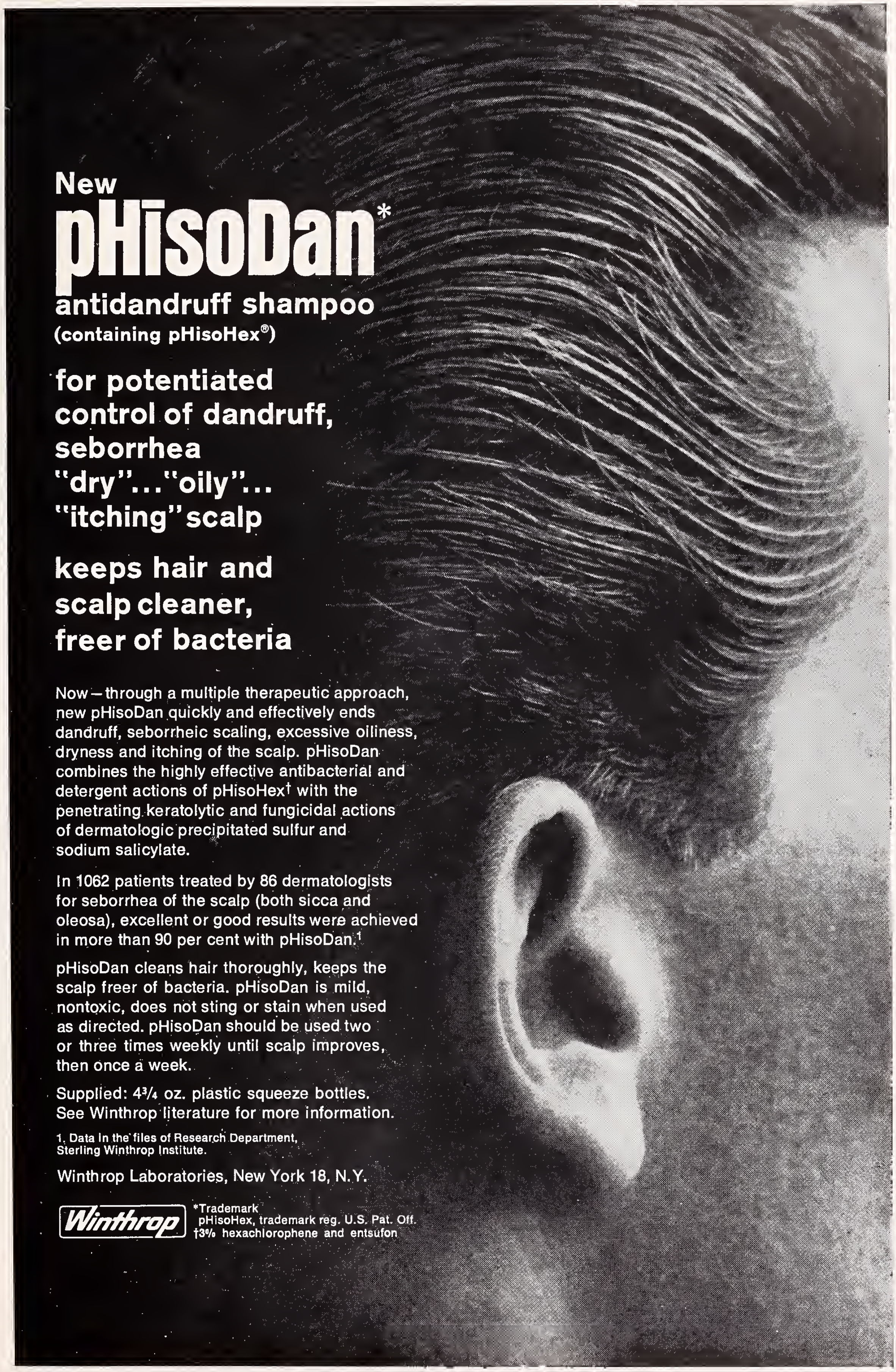
The Duke University School of Medicine is sponsoring its ninth postgraduate medical seminar cruise this fall.

The medical seminar-cruise will take doctors to the Mediterranean, visiting Lisbon, Tangier, Palma de Marjorca and Naples. The cruise ship, ITALIA, which will sail from Port Everglades on September 11th and from New York City on September 14th, will terminate in Naples, Italy, on September 28th. Some of the doctors will remain in Europe for further vacationing, while others will return immediately to the United States by ship or air.

Shipboard lectures and informal panel discussions will be given on various subjects in medicine by five members of the Duke Medical School Faculty. While designed primarily for the generalist, the program should be of interest and value to the specialist.

Approval has been requested for thirty hours credit toward Category I requirements of the American Academy of General Practice for the instructional program. Registration fee for the postgraduate course is $35.00.

Information concerning the medical seminar-cruise may be obtained by writing the Allen Travel Service, 565 Fifth Avenue, New York 17, New York.



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See Winthrop literature for more information.

1. Data in the files of Research Department, Sterling Winthrop Institute.

Winthrop Laboratories, New York 18, N.Y.

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In addition to the above, members up to age 40 may now purchase their Accident and Health protection at a 25% reduction in cost.

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SUMMARY OF PROCEEDINGS
ANNUAL MEETING – HOUSE OF DELEGATES
April 30, 1963

The Annual Meeting of the House of Delegates was held on the first day of the 171st Annual Meeting of the Connecticut State Medical Society, April 30, 1963, at the Statler-Hilton Hotel, Hartford, Connecticut. The following items of business were considered and acted upon:

Reports, Addresses, Remarks Of Officers And Others

The Delegates received reports, addresses or remarks from certain officers, the Chairman of the Council and the General Manager. These are published at the end of this Summary of Proceedings.

Reports Of Committees And Divisional Boards

As printed in the Delegate's Handbook, and as supplemented by the printed and verbal reports of Divisional Board Chairmen, the reports of Committees of the House of Delegates and the Council were received and acted upon.

Election Of Officers And Committees— 1963-1964

The following slate of officers was elected:

President: Morris P. Pitock, Bridgeport (elected 1962)

President-Elect: Ralph L. Gilman, Storrs

Vice-President: James R. Cullen, Hartford

Secretary: Orvan W. Hess, New Haven

Treasurer: Isadore S. Goldberg, Torrington

Speaker of the House of Delegates: Michael R. Scully, Bridgeport

Vice-Speaker of the House of Delegates: Clifford E. Wilson, Norwich

AMA Delegate: (Jan. 1, 1964-Dec. 31, 1965) Norman H. Gardner, East Hampton

Alternate AMA Delegate: (Jan. 1, 1964-Dec. 31, 1965) Michael A. Dean, Bridgeport

AMA Delegate: (Jan. 1, 1963-Dec. 31, 1964) James R. Cullen, Hartford

Alternate AMA Delegate: (Jan. 1, 1963-Dec. 31, 1964) Stewart P. Seigle, Hartford

AMA Delegate: (Jan. 1, 1963-Dec. 31, 1964) Ellwood C. Weise, Sr., Bridgeport

Alternate AMA Delegate: (Jan. 1, 1963-Dec. 31, 1964) Max Caplan, Meriden

Councilor-at-Large: Denis S. O'Connor, New Haven

Louis H. Nahum, New Haven, continues as Editor of CONNECTICUT MEDICINE

Divisional Boards and Committees elected by the House of Delegates and by the Council for 1963-1964 will be published with the "Roster" as a supplement to the August issue of CONNECTICUT MEDICINE.

Presentations And Awards

AMA-ERF Presentation: Dr. Deming

A check for $9,649.08 was presented to Arthur Ebbert, Associate Dean, Yale University School of Medicine, who accepted it on behalf of the school.

Press Awards: Dr. Pitock

To: Thomas F. Walsh, Hartford Courant (Feature Writing)

To: David A. Gibson, Hartford Times (News Reporting)

To: Charles J. McGill, Bridgeport-Post Telegram (Editorial Writing)

New Business

Amendment To Bylaws

The following amendment to the Bylaws was presented and immediately tabled for consideration and action at the next regular meeting of the House of Delegates:

ARTICLE IV—MEMBERSHIP—SECTION 7. DISCIPLINE

The Council shall have the power to discipline a member for cause by a two-thirds vote of the members present and voting at any regular meeting or special meeting of the Council called for this purpose. At this meeting the accused member shall have the right to be present and represented by counsel. In its discretion, the Council may evoke for cause the following disciplinary measures against a member:

1. *Reprimand*—The privileges of a reprimanded individual suffer no change in status.

2. *Suspension*—A suspended member remains a member of the Society. However, for the period of suspension, he shall lose two privileges only; namely, the right to vote and to hold office.

3. *Expulsion*—An expelled physician immediately loses all privileges and obligations to the society. The secretary shall remove his name from the roster of members. After a lapse of one year this physician may apply again for membership.

Resolution Re Hospital Costs, etc.

As reported out of Reference Committee, it was VOTED to refer to the Council for study and report to the House of Delegates the following resolution:

WHEREAS: (1) The cost of hospital care reflects directly on the medical profession. (2) Hospital costs are, and have been, skyrocketing. (3) No adequate means exist for determining the value received for the dollar spent on hospital care, therefore be it

RESOLVED: That the Connecticut State Medical Society institute a realistic appraisal of hospital costs and accounting procedures, and be it further

RESOLVED: That the Connecticut State Medical Society urge the State Insurance Commissioner to set a positive limit of payment by insurance companies, for hospital and medical services, of no more than 100 per cent of actual costs where insurance coverage is being provided by multiple insurance companies.

Report Of The Council Re Third Party Policy

It was VOTED to accept a report of the Council embodied in a document titled: "Certain Policies of the Connecticut State Medical Society Re Inter-Relationships Between The Patient, The Physician, and Third Party Entities." The text of this document is published in this issue of CONNECTICUT MEDICINE, as a supplement, for the information and guidance of members of the Society.

Resolution Of The Council Re CMS, Inc.

It was VOTED (71-16) to adopt the following resolution, recommended by the Council:

WHEREAS: An impasse appears to have been reached between the Council of the Connecticut State Medical Society, Inc. and the Corporators of Connecticut Medical Service, Inc. concerning the election of three of the Council's nominees for CMS physician directorships, and

WHEREAS: The Council's prerogative to obtain the resignation (recall) of an incumbent physician CMS Director may be exercised only "for stated cause," and

WHEREAS: The CMS Corporators, in "failing to elect" three of the Council's nominees refuse to indicate any cause, stated or otherwise, in explanation of such action, and

WHEREAS: In failing to elect, on this first occasion, three *specific* qualified nominees of the Council who are all of proven medical competence, of excellent professional reputation, are Participating Physicians in CMS and members of good standing in the Connecticut State Medical Society, the Corporators are thereby jeopardizing the rights of *all* qualified members of the Society who may be nominated by the Council subsequently to represent the medical profession on the Board of Directors of CMS, Inc., therefore be it

RESOLVED: That the House of Delegates of the Connecticut State Medical Society support the Council in its determination to defend the rights of all qualified members of the Society to be nominated by the Council to serve as representatives of the medical profession on the Board of Directors of CMS, Inc., and be it further

RESOLVED: That the House of Delegates of the Connecticut State Medical Society authorize the Council to initiate appropriate legal action, if necessary, to compel the Corporators of CMS, Inc. to seat as CMS Directors the three nominees of the Council in question.

REPORTS, ADDRESSES AND REMARKS

ADDRESS OF THE RETIRING PRESIDENT

I wish to express my deep appreciation for the honor which you have given me and especially I wish to thank you for the privilege of serving as your president this past year. It is my pleasure to recognize with gratitude the cooperation of the officers and the tireless efforts of our General Manager, Dr. William R. Richards, and Chairman of the Council, Dr. Ralph Gilman. The Connecticut State Medical Society is fortunate to engage in its office devoted personnel: Mrs. Josephine Lindquist, Miss Joan Russell, Mrs. Mary Lee, and Miss Dorothy Stratton. I would not omit Mrs. Vivian C. Feriola who religiously demanded that the president submit his monthly page on time for publication and Mr. James Burch for his assistance in public relations.

The year has been a busy one demanding the execution of a large volume of business. The Council has met once each month with many meetings extending well into the evenings. Medical organization has been the main theme of the year. Physicians are being awakened to the fact that in order to retain and maintain the American way of the practice of medicine that attention must be given to the organization and proection of our profession. No longer can we be complacent and let the world just go by. We have been hovering on the brink of subversion by politics, federal control, and other agencies which know little or nothing about medicine but are anxious to tell us how to practice our profession and how much our services are worth.

The health plans for Connecticut, as proposed by our Council and House of Delegates, seem adequate for the present. Yet last August the CMS unilaterally changed the Preferred Contract which spread discord among our members. The physicians in Connecticut have asked for and have worked for a reasonable and economic old age medical program. The enormity of the Old Age Health Program was

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great, but it was not as momentous as the politicians and federal government would have us believe.

The Kerr-Mills program appeared the most adaptable of all programs and now that 93 per cent of the Americans over 65 could qualify for some portion of the Kerr-Mills program indicates that the judgment of our physicians was a worthy decision. For individuals in the lower income groups, the CMS Preferred and Community Contracts, together with Connecticut 65, complete a sound program of health for the aged and needy at the present time in the State of Connecticut.

CSMS is a progressive medical society. Last fall the Council supported a day's program on Medical Quackery. Credit is due Dr. Max Caplan for the development and the conduction of this program which consisted of a series of papers which should be implemented in the near future and which were both interesting and instructive. The Legislative Committee supported by ad hoc committees, by COMPAC, and by the Woman's Auxiliary demonstrated a well-planned united effort which resulted in the successful passage of the Dog Research Bill. The Good Samaritan Bill is well on the road, but should it not pass the Legislature, we must keep the pressure on until we are successful in its becoming a law.

Not for several decades has medicine occupied a position as advantageous as it does today. To maintain this advantage we must make a vigorous stand and defend our hallowed objectives. Our greatest point of strength lies in a combined, unified effort by all members. Apathy has been staring us in the face but it is begining to fade. More members are attending county medical society meetings today than for many years. Fairfield County Medical Society has plainly demonstrated that it is the duty of every member to attend at least one meeting in two years. This is not too much to ask of any member. This is not compulsion; it is duty.

The indoctrinational exercises for new members in the county societies are significant and stimulate a man's interest early in his medical career. Our public relations are being activated through radio programs and speaking engagements by members before religious, educational, and social gatherings. It is mandatory that each member of the Connecticut State Medical Society spend some time each year for the advancement of organized medicine.

Today we are brought face to face with forces which desire to modify our health program and our practice of medicine. The Federal Government has been urging its health program which appears to us political, unsound, illogical, and uneconomical. The British National Health Program is being thrust at us. Russia, by persuasion, has kept up pressure to modify our ways of life and eventually degrade our medical program. The physicians of Connecticut must recognize these forces and protect our profession.

Although it has been in existence for some time, it is only recently that it has been apparent that some hospitals are taking an advantage of the doctors. This condition is causing an unrest among the physicians not only in Connecticut but in many states. The patient-physician relationship hereby becomes involved with a third party. I refer to the third party in this particular as the hospital boards of trustees which direct hospital activities. Rarely do we find one physician on their boards. Even one or two physicians on a hospital board are not enough to give a board an unbiased and the accurate viewpoint of medicine. On the other hand the boards of trustees should not be controlled by physicians but at least a 20 per cent or 30 per cent doctor representation on such boards would greatly enhance the principles and philosophy of the practice of medicine.

Such bureaucracy of hospital trustees as we now have is not due to any one person but is the result of hospital administration during two world wars. Rigid regimentation frequently leaves out human factors which are a dominant part of the thought and action on a high level. (It is the physicians practice of medicine. To overcome this situation we need responsibility to control the objectives of the medical profession according to humanitarian principles.)

This last concept brings us to the most recent controversial subject—the corporate practice of medicine. We must recall that some phase of corporate practice of medicine has been with us for many decades and it undoubtedly has a limited place in hospitals controlled by medical schools. Included in this package is the extension of the use of the emergency room where only 51 per cent of the patients are emergency cases.

Blue Cross will subsidize the payments in the emergency room but will not for the same medical service given in the private office of doctors. Why will Blue Cross pay for anesthetics in one general hospital and not in another general hospital? These inequities must be corrected. To give widespread use of the corporate practice of medicine to all hospitals appears to encourage socialistic principles and deprive doctors of certain rights and privileges. The CSMS and AMA stand united to protect the rights and privileges of their members.

The future of medicine in the State of Conecticut depends upon a unified membership hewing our objectives close to the ribs of sound medical philosophy. The physicians desire intelligent and harmonious relationships with all agencies and third parties who enter the health program. Medicine has one job to do and that is to provide the best medical and surgical care with reverence for human life. Let us do our utmost to practice, conserve, and protect our profession with dignity and honor.

Clyde L. Deming
President, 1962-63

REPORT OF THE CHAIRMAN OF THE COUNCIL

The Council has held five meetings since the last meeting of the House with the usual high level of attendance and the extended duration of the meetings.

During the months since the semi-annual meeting, there have been three changes in the membership of the Council. On December 17, 1962, Dr. Vincent A. Gorman, Associate Councilor from Fairfield County and an Alternate Delegate to the American Medical Association, died suddenly. This was a great shock to the members of the Council, as he had seemed one of the most vigorous of the members and had rendered valuable service to this Society. He was replaced as Associate Councilor by Frederick C. Weber, Jr. of Greenwich. Elwood C. Weise, Sr. joined the Council after January 1, 1963, by virtue of his accession to the office of Delegate to the AMA on that date. Alfred Sundquist of Manchester, an Associate Councilor from Hartford County, resigned in January and was succeeded by Benjamin V. White in that position.

At the January meeting, the Council voted that the General Manager prepare pertinent summaries of the actions taken

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By Ernest Aegerter, M.D., Professor of Pathology and Director of the Department of Pathology, Temple University Medical Center and School of Medicine; Professor of Orthopedic Pathology, University of Pennsylvania Graduate School of Medicine; Chief in Pathology, Philadelphia General Hospital; and John A. Kirkpatrick, Jr., M.D., Radiologist, St. Christopher's Hospital for Children; Associate Professor of Radiology (Pediatrics), Temple University School of Medicine; Radiologist, Children's Heart Hospital. About 800 pages, 6½" x 9¾", with about 541 illustrations. About $16.00.

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SJG 6-63

by the Council for publication in Connecticut Medicine and that detailed minutes should be kept on file at the office and mailed to all members of the Council and the House of Delegates.

Under the provisions of the new By-Laws pertaining to Life Members, seventy members of this Society have been approved for Life Membership. There have been a number of administrative and technical problems connected with the implementation of the By-Laws in this matter and, at the meeting of the Council on April 17, 1963, it was voted that, effective as of the adjournment of that meeting, physicians whose applications for Life Membership are approved by the Council shall become Life Members on January 1 of the succeeding year and shall not become exempt from dues until that time.

At the meeting on March 21, 1963, a report from the Division on Public Relations was presented requesting approval of a project to put on a series of Society-sponsored radio programs through WBMI-FM for fifty-two weeks under the conditions specified and recommended by the Divisional Board on Public Relations. After this presentation and after listening to sample tapes of "Doctor's House Call," the Council authorized this program, including the expenditure of funds up to the amount of $2344, to be appropriated from the Contingency Fund for 1963.

The Council, at the March meeting, also approved the establishment of a Section on Internal Medicine, after receving their Purpose and By-Laws and finding that they conformed with the recommendations for such a Section.

At the meeting of the House on May 2, 1962, the following resolution was passed:

> Be it Resolved: That the House of Delegates of the Conecticut State Medical Society direct the Council of the Connecticut State Medical Society to reopen negotiations with the Connecticut Hospital Association for the purpose of establishing an impartial joint committee to review and assist in the revaluation of problems involving the dismissal of physicians from hospital staff membership and/or reduction in privileges of hospital staff members.

This resolution was referred to the Committee on Hospitals which discused it at a joint meeting of the Committee on Professional Practices of the Connecticut Hospital Association in October 1962. The latter in turn referred it to the Board of Trustees of the Hospital Association. Following a reply from this body, the Hospital Committee reported to the Council as follows:

> It is our considered opinion that the Board of Trustees of the Conecticut Hospital Association will continue to be unmoved in this problem as long as they feel that the weight of the legal situation so favorably affects the present status quo.

The Council reluctantly reports this failure to achieve a successful result requested by this House.

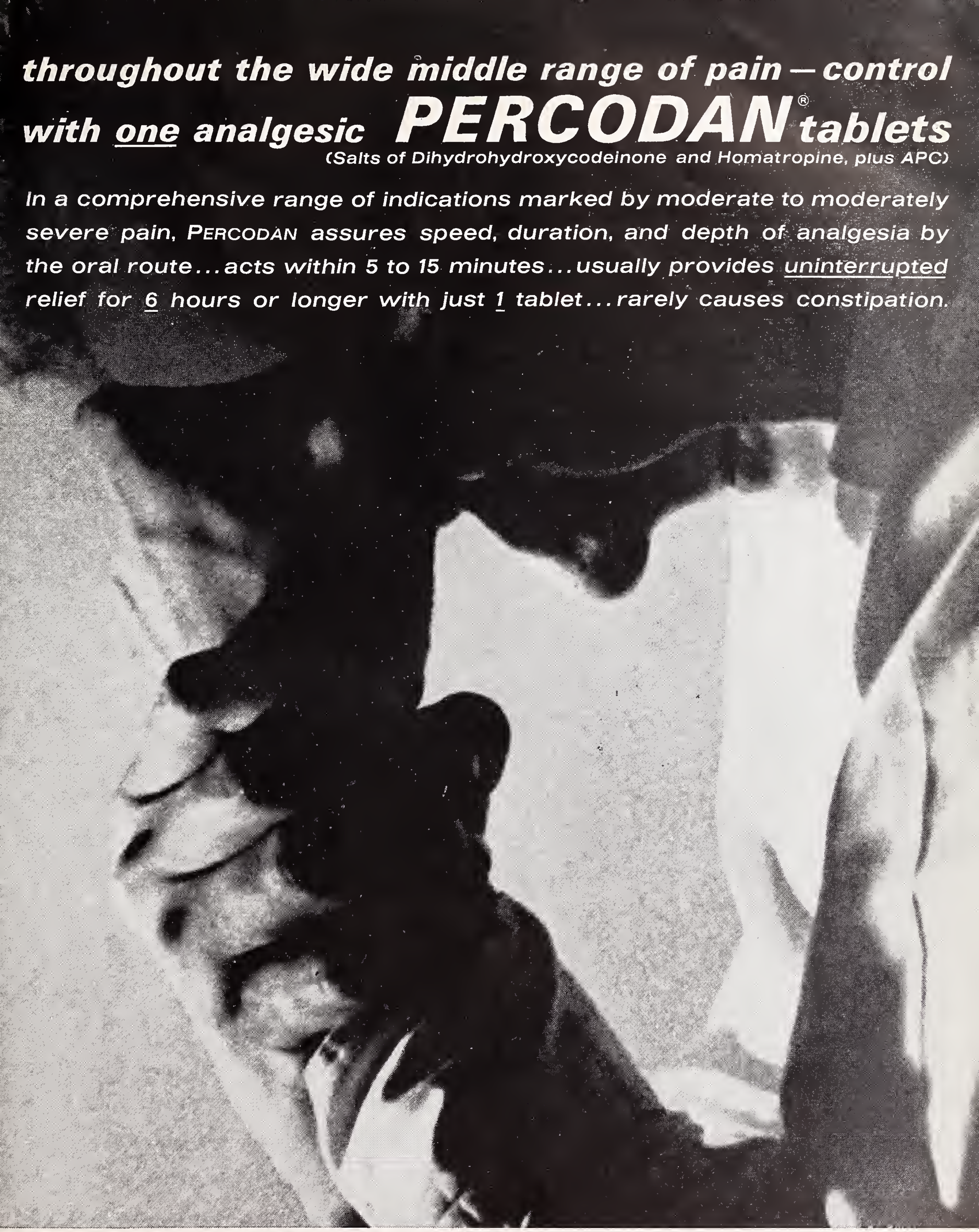
In January, the Committee on Hospitals prepared a lengthy analysis of a survey of hospitals in Connecticut concerning House Staff remuneration and the cost of financing House Staff education. A sub-committee of the Council met with the Chairman of the Committee on Hospitals and, at the Council meeting in March, seven recommendations of the Committee on Hospitals on this subject were approved. It was voted to publish these recommendations in Connecticut Medicine and to send copies of them to all members of the Education and Hospitals Division. It is hoped that these will serve as a useful guide to all the hospitals and the medical staffs who have had to wrestle with this problem.

During the past two years, there have been some meetings of what was first called the Four-Agency Conference, namely representatives from the Conecticut State Medical Society, the Connecticut Hospital Association, Connecticut Blue Cross and Connecticut Medical Service. To this group were added later, representatives from the Health Insurance Council so that it became known as the Five-Agency Conference. The original purpose was to provide a forum for a discussion of mutual problems with the hope that it might produce a better understanding of each other's problems and possibly some concrete results in mutual cooperation. The December meeting of this Conference was hastily cancelled when it was learned that the agenda was to contain a resolution from the Connecticut State Medical Society defining that Radiology, Anesthesiology, Pathology and Physiatry were to be recognized as the practice of medicine, to be engaged in by physicians rather than by hospitals. To my knowledge, no subsequent meeting of this Conference has yet been called. Although the Council has taken no action on this matter, it is the personal opinion of the Chairman that the refusal to discuss a controversial subject, which involves problems of practically all of the components of this Conference, has quite effectively eliminated any real reason for a continuation of the group and certainly is contrary to what was considered to be its original purpose.

You have received in the Handbook, along with the reports of the Committees of the Society, the reports also of the Representatives and Advisors of the Council. None of these include any recommendations for action by this House, but it is hoped that the members will at least acquaint themselves with the contents of them.

At the meeting of the Council on April 17, the following change in the By-Laws was acted favorably upon and is submitted at this time and will be placed upon the table without dicsussion until the next regular meeting of the House of Delegates. This change involves the addition of a new Section, namely ARTICLE IV—MEMBERSHIP, Section 7. Discipline

> The Council shall have the power to discipline a member for cause by a two-thirds vote of the members present and voting at any regular meeting or special meeting of the Council called for this purpose. At this meeting the accused member shall have the right to be present and represented by counsel. In its discretion, the Council may evoke for cause the following disciplinary measures against a member:
>
> 1. *Reprimand*—The privileges of a reprimanded individual suffer no change in status.
> 2. *Suspension*—A suspended member remains a member of the Society. However, for the period of suspension, he shall lose two privileges only; namely, the right to vote and to hold office.
> 3. *Expulsion* —An expelled physician immediately loses all privileges and obligations to the Society. The secretary shall remove his name from the roster of members. After a lapse of one year this physician may apply again for membership.



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The subject of the corporate practice of medicine, especially as it relates to hospitals, has been a thorny problem for many months and has had a great deal of discussion, both within and outside the Council. It was reported to this House in December that a detailed legal analysis by Mr. Edward L. Marcus of New Haven had been received and that each County Association had been requested to call a special meeting of their Societies to advise the Council as to what action should be undertaken. There was some confusion about this and at least two of the Counties felt that the Council should first outline what specific action it intended to take. As of the present, six of eight Counties have voted to support the Council's intention to pursue this matter, but there is still considerable difference of opinion, both in the County Associations and in the Council itself, as to the best method to follow in attempting to outlaw the corporate practice of medicine by hospials. A sub-committee of the Council was appointed to study the developments in this field, to collect information from all parts of the State and to outline in specific detail to the Council a possible course of action for consideration. To date the Committee has not yet rendered its report.

At the December meeting of this House, two resolutions were presented. Resolution No. 1 was entitled "Definition of Certain CSMS Policies on Doctor-Care and Its Financing." It was voted by the Council to refer this resolution to the Special Committee to Formulate Third Party Policy for further clarification, refinement and definition of the policies contained therein. You have received, for consideration today, this report in its entirety, and I will not comment further upon it at the present moment. Resolution No. 2 of the December meeting, entitled "Increasing the Availability of Service Benefits Prepayment Plans" was passed, and the Council was authorized to pursue this subject and to present a comprehensive report at this meeting of the House. A sub-committee was appointed as follows: E. Tremaine Bradley, Chairman, Frank K. Abbott, Nicholas T. Phillips, Lavius A. Robinson, Jr., Norman J. Barker, and Albert L. Larson. At the April meeting of the Council, Dr. Bradley presented the following report:

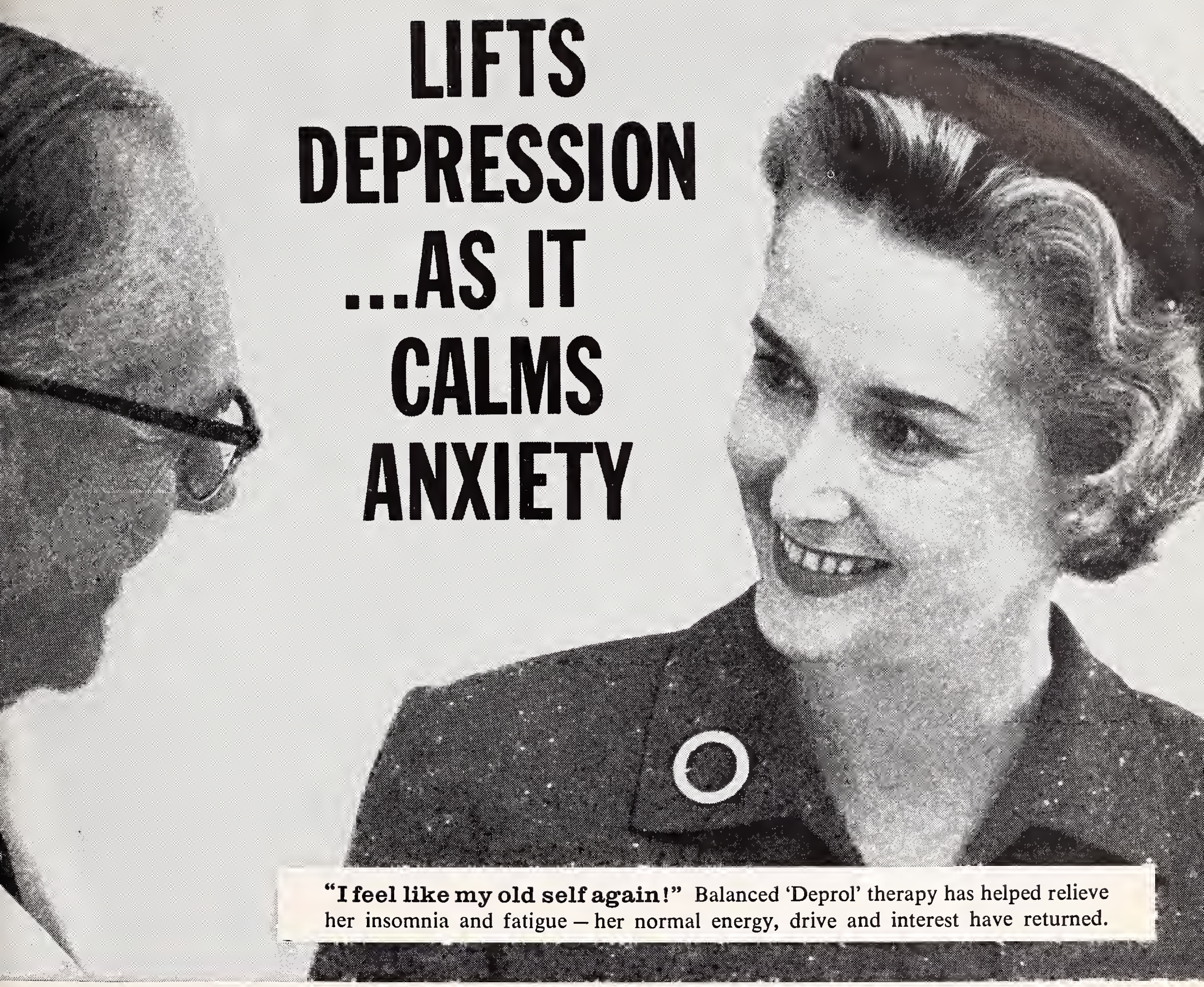
> The Committee on Resolution No. 2 had one long meeting with much preliminary discussion. Time since then has been spent collecting material from various parts of the country about different methods of providing prepaid medical care for the populations. Much more work must be done before a final report is ready, we hope for the Semi-Annual Meeting in the fall. Meanwhile it can be said that there is a considerable variety of plans for providing prepaid medical care, with and without Service Benefits provisions, that are actually working well in this country. The Committee's work to date therefore can be summed up in one word—"progress."

The indulgence of this House of the time necesary to complete this project is hopefully requested.

Like taxes, CMS, Inc. is always with us. The Joint Liaison Committees met January 17, 1963 and at that meeting appointed the following physicians to the Medical Advisory Committee: Rembrandt Dunsmore, Neurosurgery; Joseph J. Mahoney, Ear, Nose and Throat; Edward D. Powers, Orthopedics. Subsequently, the Joint Committees also appointed Allen J. Ryan as Chairman of the Medical Advisory Committee, and Francis Gallo of Winsted as Vice-Chairman. Dr. Mahoney declined, for personal reasons, to accept this appointment and was replaced by Dr. Edward H. Truex, Jr. of Hartford. During the January meeting of the Liaison Committees, discussion of a proposed "Extra Protection Endorsement" was held, and it was your Committee's opinion that this idea warranted further exploration, but a majority were *not* in favor of including Service Benefits feature in a rider of this type. The President of Connecticut Medical Service also initiated queries concerning reasons that this House directed the Council to undertake a study of the possibility of increased availability of Service Benefits Protection in conjunction with insuring agencies other than Blue Shield. During this discussion, it was more than once suggested that perhaps CMS should restate its current objectives and future goals so that if they differed substantially from those jointly agreed to in 1948, perhaps a re-evaluation of the relationship between CMS and the Society would be in order.

In December, Dr. Frank L. Polito of Torrington resigned as a member of the Board of Directors of CMS. In January, the Council submitted to the Corporators of CMS, the names of five physician nominees, one to fill the vacancy occasioned by Dr. Polito's resignation and four for the two-year terms beginning at the conclusion of the Annual Meeting of CMS in February. Under date of February 26, 1963, in a letter addressed to me as Chairman of the Council and signed by Joseph V. Cronin as Secretary of CMS, the Council was informed that three of these nominees failed to be elected on secret ballots taken in Executive Session, and requested a joint meeting of the Liaison Committees. This was held on March 12 and there was a lengthy discussion by the President of CMS that the Corporators were firmly of the opinion that only those people should be elected as Corporators who strongly support the Service Benefits principle as well as the principles on which CMS was originally founded. Your Committee could get no satisfactory answers as to why these three physicians failed of election.

At the Council meeting, March 21, 1963, it was voted that the nominations of the three physicians who had failed of election be resubmitted and that CMS be informed that, in the opinion of the Council, these nominees are well-qualified to serve as CMS Directors on the basis of their professional competence, professional standing and familiarity with medical economics and matters relating to CMS. Under date of April 11, 1963, your Chairman was informed by letter from the President of CMS that these three nominees again failed of election by secret ballot in Executive Session. He also transmitted a lengthy mimeographed document entitled "A Statement by the Corporators, Connecticut Medical Service, Inc., April 4, 1963." Copies of this were distributed to members of the Council before the April meeting and, after consideration of the communications from CMS, an analogous statement by the Council was adopted and transmitted to the Corporators. In this statement was an invitation to CMS Corporators to a joint meeting with the Council, each to have legal counsel present, for a discussion of the legal questions involved. At that meeting, it was voted that the Chairman appoint a committee consisting of five members of the Council and Dr. Richards, the General Manager, and it further voted to authorize this committee to employ legal counsel to obtain a definition of the legal rights of the Connecticut State Medical Society with respect to these nominations. In the meantime, CMS is in the status of a recessed annual meeting. A special



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meeting of the Council is being called for 9:00 a.m., April 30, prior to the meeting of this House to receive the report and recommendations of this sub-committee, and the action of the Council upon it will have to be given verbally at the meeting of the House.

Respectfully submitted,
Ralph L. Gilman
Chairman of the Council

REPORT OF THE TREASURER

House of Delegates—April 30, 1963.

The financial statements prepared by Seward & Monde, auditors of the Society, are printed in the Handbook. These statements are respectfully submitted as the report of the Treasurer. It is to be noted that in the overall operation of the Society, there was an excess of expenses over income of $13,524.39. This is primarily due to the excess of expenses over income of $11,868.53, in Journal operations. There was also an excess of general expenses over income to the amount of $1,655.86. Thus, this totalled an excess of expenses of $13,524.39 over income. With the transfer of $4,500 from surplus funds for preliminary expenses of the Relative Value Study, the surplus fund of the Society has been reduced since the last report to this House of Delegates by $18,024.39.

The Investment Committee of the Society, upon direction of the Council, has undertaken the investment of some of the surplus funds of the Society. After consultation with legal counsel and investment counselors, the following program has been adopted by the Council on July 5, 1962.

> The following is a report of the Investment Committee:
>
> That one-third of the general fund is to be held in a highly liquid state. This would mean that this section of the over-all fund would be committed to short term U.S. Treasury Bonds or held in Mutual Savings Banks.
>
> The remaining two-thirds of the general fund would be committed to a balanced investment program to be designed and executed by the Investment Committee. The Committee would in turn be controlled by the laws governing the Investment of Trust Funds in the State of Connecticut. Thus the committee as a body is held to the performance of a prudent professional investor, with the advice and recommendation of the Trust Department of the Second National Bank of New Haven, which has been engaged as the Society's investment counselors. The committee is empowered to make specific selections in matter of stocks, bonds, and other investment media; and the committee is required to provide periodic accountings every 4-6 months. It is anticipated that the Society can benefit by a carefully selected investment program by long term growth and capital gains, which is not realized in savings banks.

Respectfully submitted,
I. S. Goldberg,
Treasurer

REPORT OF THE SECRETARY

You will hear reports today from the Chairman of the Council and others. In addition much information has been recorded in the printed Minutes which have appeared in Connecticut Medicine. Furthermore, reports of Committee Chairman are included in your Handbook. Consequently, a report of the conventional type by the Secretary would be repetitious. This seems to be an unwarranted infringement on your time and your patience. I shall therefore limit my brief remarks to a few matters which are felt to be of major importance to you.

The Membership of the Connecticut State Society now numbers 3424. This figure represents a net gain of 46 members during 1962. There has been a notable number of applications received for enrollment in the category of Life Membership since the enactment of the new By-Laws.

The Members of your Council, travelling long distances and sacrificing much of their time, have performed their duties with dedication. Aside from attendance at special and ancillary meetings, it has been necessary to devote one day each month for this purpose. Often as many as 20 or 30 items appear on the agenda and a number of these require study in depth before reasonable decisions can be reached.

The majority of some 60 committees of the State Society have been active and productive. Experience with the alteration of the organizational structure created by the new By-Laws is insufficient at this time to give conclusive indication of advantages or disadvantages. Some divisional chairmen have felt that improved coördination of activities of committees within the group has occurred. Others feel that the existence of some overlapping areas of responsibility here and there between committees has resulted in duplication of effort.

An Ad Hoc Committee, appointed by the Council to evaluate the adequacy of the Society's existing committee and staff structure, has held several meetings and is carrying out studies of several areas in depth. A resumé of the findings and recommendations of this committee will be filed with the Council in the near future.

The State Society continues to manifest its interest in the support and advancement of medical education in numerous ways. Recognizing the necessity of recruitment of medical personnel for the future, the Committee on Health Careers, under the direction of Dr. Mann, aided by the Woman's Auxiliary, has published a Guide Book for High School students and teachers. This publication will aid school guidance counsellors to bring the Health Careers story to our youth and aid students in the selection of a career which will fill one of medicine's most vital needs. Further indication of a continuing interest in medical education by members of the Connecticut State Medical Society is the noteworthy contribution of $22,000 to the AMA Education and Research Foundation this year.

The Committee on Hospitals, under the Chairmanship of Dr. Leopold Trifari of New Haven, has worked energetically on several important projects of major significance. These range from surveys of means for providing adequate house staff remuneration, establishing improved Physician-Hospital relationships and utilization of Hospital services to the cost of Hospital education programs and the shortage of house staff.

Some pursuits of Committee Members have received recognition at the National level particularly in areas of Accident Prevention, Youth Fitness, Mental Health and Immunization programs.

An outstanding achievement during the past year has been the development of more effective methods of engaging in legislative and political affairs and a new vehicle—COMPAC—for allowing doctors to take a more active part in public affairs pertaining to medicine and its practice.

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An important report of the activity of the Third Party Payments Committee with certain recommendations on policy will be presented at this meeting. During the past year, relationships of the Connecticut State Medical Society and the Conecticut Medical Service Corporation were severely tested during the consideration of changes in the Preferred Contract. Misinterpretation of aims particularly related to the Service Benefits aspect led to sharply conflicting opinions.

Taking unilateral action in the final adoption of the contract, proposals of the State Society deemed to be in the public interests were rejected by the C.M.S. Board. It has been the expressed opinion of members of the Liaison Committee that a clear definition of policy, or changing policy, of C.M.S. should be presented by the corporation's representatives in the near future if an irreparable dichotomy is to be avoided. The present position of equal representation of the State Medical Society on the Board of C.M.S. and proper recognition of the professional guidance of the Connecticut State Medical Society in the development of new contracts must be maintained.

We are faced with a changing climate of medical affairs in which legal advice and interpretation of the laws are frequently required. Most doctors, even though sincerely dedicated and experienced, have a feeling of inadequacy in approaching problems in which the ultimate decisions are prone to rest on a legal, rather than on a medical, basis.

For this reason it seems inevitable that the Society will need professional counsel to provide it with qualified opinions more often today than in the past. Such counsel would afford more substance and effectiveness to the decisions and actions of the official bodies responsible for administering the affairs of the Society. This, of course, will involve added expense. The ability to finance this and other desirable undertakings must be faced squarely by our Treasurer—and by us all. It seems that unless our work can be done well and with authenticity, its long-range value will remain in doubt.

During the past year the medical profession continued to be confronted with numerous challenges. Chief among these was the King-Anderson Bill. You will recall the remarks of Dr. Annis, now President of the A.M.A., who spoke to us here one year ago concerning the existent anxiety surrounding the possibility of passage of this ill-conceived legislation.

Up to the present, your efforts have been successful in obtaining a majority agreement with your point of view within the House Ways and Means Committee. It may be anticipated, however, that renewed political maneuvers on the part of the Administration may make these efforts, in contrast, appear as mere intramural skirmishes. There can be no relaxation in your efforts if this Society is to maintain its present position concerning pre-requisites necessary to provide the highest quality of medical care for all our patients.

Respectfully submitted,

Orvan W. Hess,
Secretary

REPORT OF THE GENERAL MANAGER

Today, the House of Delegates has an unusually full agenda before it and, in addition, I have been informed that several of your principal officers are planning to address you on matters of considerable importance.

Therefore, in order to permit the House to transact its business within a reasonable period of time, the General Manager is curtailing his customarily lengthy remarks on this occasion. A few of you may be a litle disapointed to learn this (I hope, I hope!), but I can almost hear the many indulging in a quiet but deep sigh of relief. I hasten to add, however, that my resolution to be comparatively brief should not be interpreted as meaning that there is nothing of note for me to report. Quite the contrary!

Some of you may be surprised—as I am—that this meeting of the Society marks the end of the fourth year of my incumbency as its full-time executive officer. During those years, a great many things have happened. For the most part, I think, these happenings have afforded some measure of encouragement and, in most areas, a perceptible sense of progress in the right direction.

For example, the membership of the Council and the House of Delegates has undergone marked changes. Many physicians are serving in both these bodies now who were unknown to their colleagues only a short time ago. The county associations continue to send different men and women to represent them, and I never cease to be amazed—and heartened—at the dedication and capacity for plain hard work that most of both the new and the retired members have demonstrated, week by week and month by month. It is not for me to say—perhaps not even for them to say—that the decisions and actions of the Council and the House have always been precisely right or "just what the doctor ordered," but it is my sincere judgment that, in trying to deal wisely and fairly with quite a variety of pretty sticky problems, a most commendable job has been done consistently by those who have been charged by the membership with the responsibility of administering the affairs of the Society. It has often been said of President Eisenhower that if he did not entirely succeed in bringing peace to the world, at least he was passingly successful in preventing the spread of war. Perhaps it would be more or less appropriate to bestow similarly reserved praise on your Council and yourselves—faint though some might consider such praise to be.

In most corners of the earth, the medical profession is in trouble—trouble much worse than anything we have encountered in America up to now. In a dozen major countries, the turning to government to iron out every real or imaginary difficulty—the tendency to rely on the medical agency or the medical institution, instead of the medical practitioner—the advancement of the false, socialist philosophy that the doctor's hard-come-by skill and knowledge belong in some way to almost everybody but himself—have brought about deplorable situations there in which questions concerning care of the patient can only be settled by the picket-line, the walk-out, the march on city hall or even the club and the "Molotov cocktail."

In 1963, American medicine is treading a narrow and treacherous path indeed. On almost every hand, there is someone with another new plan to dispose of the physician's services *for* him and to regulate his professional freedom. The need for "all good men to come to the aid of the party" was never greater or more pressing. The day has passed when just a few doctors—a comparative handful—can do every committee's work, speak to all our legislators, take up our political cudgels and so on, while the rest sit back—aloof from it all—and act like so many spectators. The "rank and file" (to use a labor term) must be persuaded to participate wholeheartedly, and the leaders must not be afraid to lead bravely if our free system is to prevail.

Something to think about, isn't it Doctor?

Under the provisions of the Self-employed Individuals Tax Retirement Act of 1962, doctors may set aside retirement funds for themselves and their employees and deduct part or all of such amounts for income tax purposes.

Our Trust Officers will be in close touch with developments affecting the new law. If you wish, we shall be glad to keep you informed of these developments.

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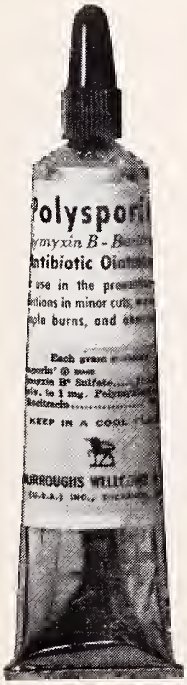

Leaders require adherents, but not those who will follow like sheep while all is calm, but run hither and yon in panic at the first sign of danger; not those who are agreeable to giving lip-service when little is at stake, but are prone to abandon principle under pressure; not those who will cheer when victory seems at hand, but carp in criticism when the team is behind. Professional freedom and personal liberty are on the line today, as they were back in American revolutionary times, and the battle will no more go to the weak and timid in 1963 than it did in 1775.

I promised to be rather brief, and I shall. I will conclude by quoting to you the words of two of our distinguished Past Presidents, John N. Gallivan and Thomas M. Feeney, both (it so happens) of Hartford. In presenting the Report of the Council to the House of Delegates on April 29, 1958, as Chairman, Dr. Gallivan said: "It is fitting and proper that the House, as spokesman for organized medicine in Connecticut, should give consideration to matters which involve the question . . . of leadership. It is well to remember, in this connection, that leadership finds its source in understanding and that understanding, in (dealing with) human problems, requires not only search for and analysis of all available facts but also a capacity for analysis of the emotional forces that motivate conduct."

And on July 22, 1958, on a critical issue of that year, Dr. Feeney reported to the House: "Your Council has proceeded honestly and sincerely to seek a settlement of this controversy. The Council does not feel it is in any position to compromise clear-cut (principles in this matter). If the Council were to act otherwise, it could justly be charged with willful failure of its duties."

Occasionally, the words of the best of men return to haunt them—and those who were their listeners. In this instance, however, it seems to me that the words of these past leaders hold lasting wisdom and are as meaningful today as when they were spoken some five years ago.

Almost every day, almost everywhere, someone or some agency is challenging the leadership of American medicine; is giving voice to insinuations that those who have been elected to office by a majority of members do not, in fact, represent a majority of members; is suggesting—even in our own state—that your officers, your Councilors, you delegates yourselves, are serving here today without the real consent or confidence of your confreres back home.

In dealing with the important business which comes before you at this meeting—some new and some distressingly old—may I respectfully urge you to (as Dr. Feeney said) "proceed honestly and sincerely to seek a settlement" of the complex problems you will be asked to resolve and, after separating the wheat of fact from the chaff of emotion, to proceed to establish the authenticity of this House (as Dr. Gallivan said) as " the spokesman for organized medicine in Connecticut." I hope you are inclined to agree with me that the one is likely to have little meaning without the other.

Respectfully submitted,

William R. Richards
General Manager

ADDRESS OF THE INCOMING PRESIDENT

Mr. Speaker, Dr. Deming, fellow officers, Members of the House, and distinguished guests: First, may I pay my respects to our retiring president, a gentleman who has given the office a grace and distinction which has made it an honor and a pleasure to serve under him. I should also like to add my respects to the past-presidents who have been my predecessors in this high office. They have served us well—and have deserved the honors you bestowed upon them. In keeping with the tradition they have established, I pledge to you that during my tenure I will do my best to speak and act at all times in accordance with the views held by the majority of Connecticut physicians, views which I believe to be so admirably reflected in the democratic proceedings of this House and of the Council.

It is my honest belief that nothing spectacular can result from my now having acceded to this position of responsibility. What I may do, as an individual, in my efforts as your president, must be augmented by the efforts of all members of our Society. If the high ideals and laudable objectives of the American medical profession are to prevail in this great, free nation of ours, it will be *only* because *every member* of our profession believes that they are worth preserving—at whatever cost in personal efforts—and joins with his elected leaders at local, state and national levels in carrying on the good fight.

In all things pertaining to the welfare of Connecticut medicine, I shall try to conduct myself in a manner appropriate to my office. But before I assume the full status of the "organization man,"—there are things I must say because I believe them, and because I hope that I express your beliefs as well.

It is my earnest conviction that the time has come for us to put into proper perspective the continuing attempts of the leadership in our Federal government to subvert the art and science of Medicine to political purposes. In my judgment, the unbridled harassment to which our profession has been subjected for many years is not being brought to bear solely to benefit the aged through Social Security medicine. This persistent badgering of the doctor involves far more than that and, in fact, is only one small part of the over-all picture.

When I say "subversion," what else can I call it when the Dept. of Health, Education and Welfare constantly asserts that Social Security medicine is a form of insurance, while the Supreme Court of the United States bluntly calls it a tax? What is it but subversion, to lead our citizens to believe that the Social Security tax is a form of pre-paid medical insurance? Is not this a distortion of the truth—subversion to take the word "insurance," which has long been understood to be a contract between an insurance company and a citizen to buy guaranteed protection for so many dollars, and to apply it to a system which since its inception has been changed by every Congress during every Congressional election, for purely political reasons?

Is it not subversion to degrade the medical profession because Congress writes a Kerr-Mills law which many states vitiate by imposing $100 deductible clauses, to which the profession is unanimously opposed?

Is it not subversion, or worse, to engender in the aged the suspicion that the medical profession is their enemy because it opposes social security medicine? Who was it that was the friend of the aged before the politicians awoke to the fact that there were 18 million of them—and that they could vote? Is it the doctor who inpoverished the aged—or did the withholding tax have something to do with their inability to lay something by for old age?

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The truth of the matter is that social security isn't just a plan to provide "free Medical care" for the aged. It's the foot in the door which opens onto the main line to total socialization of medicine. Nor need those not yet on the firing line remain too smug because their turn has not yet come to fall under the searching eye of the welfare state. Socialization of medicine is only the first step in the socialization of a nation. This is a pattern of paternalistic government, too often repeated in this era, to be easily misinterpreted. Does the recent election held by our northern neighbor signify a result which gives us comfort in its contemplation? Indeed not There, it is no longer a question whether the government is a socialist one—only what kind of a socialist government it shall be, Liberal socialist or Tory socialist. Too soon may the time be upon us when we too will be deciding whether we shall have Republican Socialism or Democratic Socialism.

Socialism is nothing new—indeed it has been in existence long enough to have disproved itself. Nor is socialized medicine new. Long before British nationalization of medicine, there were socialized systems in the Scandinavian countries and in many of the countries of Europe, Australia, New Zealand and even Mexico. But where is it that Medicine stands at the pinnacle of achievement? In the socialist countries? Certainly not! American Medicine is today the world's best medicine, attested to by the very aged who are now being subverted to consider that profession their enemy which is largely responsible for their very existence.

Let us not underestimate the skills of our politicians. It is not for nothing that the word politician bears an unsavory connotation in our great country. Elsewhere the politician is more often considered a statesman. But in America, "politician" evokes memories of pork barrel, log rolling, veterans hospitals in naked deserts, withholding taxes which make every employer a government tax collector and so insulates the citizen against the pyramiding folly of deficit spending that he considers only that much which he takes home in his pay envolope as his true pay. Yet election after election is won by promises of something for nothing, which invariably increases the costs of the burgeoning welfare state far beyond our ability to pay and for which the conscienceless politician has but one answer, to borrow from the future. No wonder the ancient sage has said that to save fools from the consequences of their folly is one sure way to fill the world with fools.

I'm old enough to recall when the national budget was 4 billion dollars, and this without deficit spending. It was peace time, of course, but even a world war left the nation in debt to the extent of only 22 billion dollars, a sum then considered astronomical. The audacity of President Roosevelt, when he suddenly increased the budget to 10 billion dollars was shocking, but pardonable in view of the extraordinary measures required for combatting the depression. Things have moved so rapidly since then that today 10 billion dollars only pays the interest on the national debt—and is less than the administration's proposed deficit in a 98.6 billion dollar budget. This is the administration which in its first 2 years has raised the national debt by 22 billion dollars. This is the administration which proposes to socialize medicine in order to give the citizens "free" medical care—to run American Medicine better than the American Medical Profession has done.

The candidates for office become prettier, the brain trusts brainier, and the voting public progressively more brainwashed until the very precepts of morality which once guided them in knowing right from wrong no longer pertain. When the federal government puts out propaganda that we can spend ourselves into greater prosperity by borrowing from future generations, it not only seems plausible, but wins general approbation, because a cut in taxes is promised at the very same time. The same citizen who gets anxiety headaches each pay day—because after withholding taxes and union dues, there's not quite enough to meet current bills, and who would never dream of mortgaging his future by limitless borrowing, sees nothing wrong in the monstrous manner in which his government's bookkeeping is done. Yet a national debt of over 300 billion dollars isn't enough for a government which believes that we can become richer by cutting taxes and increasing budgetary expenditures by deficit spending, both at the same time. Obviously, our government never heard of Edna St. Vincent Millay:

"My candle burns at either end
It will not last the night
But oh my foes
And ah my friends
It gives a lovely light."

When a government which manages its own affairs in such a way that it has to relegate 10 per cent of its income just to pay the interest on its debt, now proposes to enter the highly specialized field of medical care—to the aged or to any others who need medical care—one can only wonder whether it will do a better job on medical care than it has done on foreign affairs (need I enumerate?), the agricultural problem, the problem of veterans, or indeed, the problem of its own debt in the richest era ever known to man. I doubt very much that an administration so incompetent as to have boosted the already enormous national debt by 22 billion dollars in only 2 years can be entrusted to administer medical care as efficiently or economically as it is now administered by the medical profession under free enterprise.

We've been the target for political expedience far too long. We have been diverted from our normal function for too long. Our job is to make progress— rapidly and efficiently, to alleviate those ills of mankind which we have learned so well to do and which no one can do better—not government—not vote hungry politicians, no one but doctors. We make no pretense at skills we do not possess. Let the economic wizards of Washington solve the problems of economics and social sciences. We'll solve the medical problems of our society and we will continue to bring our patients the benefits of our learning and experience as we always have—with honesty, self-sacrifice, and the very best we have to offer.

To this we have always been pledged, our codes have been the most upright in the history of man. We mean to do no less in time to come.

What is it we want? It's very simple. We want only to continue the privileges that free enterprise has given us heretofore, so that we may do as well or better in the future.

The time has come to shout this from the house tops.

Morris P. Pitock
President, 1963-1964

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Report Of The President Of The Woman's Auxiliary To The House Of Delegates Of The Connecticut State Medical Society

"Rx—Service Through Informed Membership" has been the underlying foundation of the planning of the Woman's Auxiliary to the Connecticut State Medical Society this year. From observation of Auxiliary members over an eighteen year period I have changed my conception of doctors' wives Eighteen years ago I thought they wore glamorous hats. Twelve years ago I became aware of the activities and accomplishments of the women beneath the good-looking hats. Why did I become aware? Simply because a county president asked me to be art chairman. Now that is a very unimportant job in itself but it made me feel important to the group. I was responsible for one small part of the Auxiliary work and in doing my job I learned about the wider aims and purposes of the Auxiliary.

Today I am convinced that in the group of doctors' wives there are many able, intelligent women who could be of great service both to you and to our Auxiliary.

The Auxiliary's challenge is to discover how we can make these women aware of opportunities for service—service to their communities, service to their doctor husbands, service to the Connecticut State Medical Society. Information, plus that magic quality, inspiration, might spark a miracle.

In planning the year's program the first aim was to inform our members about legislation, a natural priority project. The Legislative Workshop, held in early June, was planned to present accurate information about the King-Anderson Bill to key women and Auxiliary leaders, and to demonstrate how Auxiliary members can present these facts to their own members and to members of other organizations. Each county undertook an active letter writing campaign to Connecticut's senators and congressmen. Telegrams were dispatched to Wilbur Mills and thousands of pamphlets were placed in offices of doctors and dentists. Many "coffees" were held where informed Auxiliary women explained the facts of the King-Anderson legislation to lay women. A few dedicated women spoke to lay groups about King-Anderson legislation and its inherent dangers. We all breathed a sigh of relief when the Senate voted down the hastily conceived Anderson-Javits Amendment.

There was no time to rest as election activity was upon us. Early in September the Auxiliary Workshop was planned to achieve the following purposes: 1. To inform its members with challenging speakers on membership, program planning, and effective Auxiliary procedures. 2. To promote communication of ideas from national to state and from state to county levels and 3. To promote effective community service. How to be effective in politics was featured by Lee Ann Elliot, Assistant Director of AMPAC. Each country was involved in Compac activity, perhaps due in some measure to the spark provided by Auxiliary preparation. The Legislative Committee was again called upon to work for the passage of the Humane Research Act. Letters and telegrams were sent from each county which helped in the passage of the "Dog Bill". Dr. Averill A. Liebow wrote, "The ladies of the Auxiliary clearly exerted a most important force in securing passage of the Humane Research Bill in this year's legislature." We stand ready to help again now that the Anderson-Javits amendment is the new threat to private medicine. Never underestimate the power of a woman! We are 1204 strong!

Although we have gained 143 new members, our total is just 48 more than last year. We have about one-third the membership of the Connecticut State Medical Society which leaves a mighty big challenge for future officers. I feel that one of our membership problems is caused by the fact that we do not immediately avail ourselves of the help each new member might like to give. However, we also welcome new members who do not intend to be active as their dues help the Auxiliary carry on its expanding program of service and education.

In co-operation with the Rural Health Committee of the State Medical Society, six county auxiliaries staffed health exhibits featuring oral polio vaccine at nine country fairs. Volunteers have been trained to assist at pre-school vision screening clinics and glaucoma detection clinics, thereby cooperating with the Connecticut Society for the Prevention of Blindness. Hartford provides 25 volunteers for the Meals on Wheels program. Auxiliary members are active in all phases of community service, such as Red Cross Blood Bank aides, workers in oral polio clinics, and as kind friends of forgotten patients at mental hospitals.

Six tons of medical text books and journals were collected by Auxiliary members working for the International Health Activities committee. This literature was shipped overseas through the Darien Book Aid Plan, Inc. whose purpose is to build peace, understanding, and friendship among the people of the world by free distribution of books and magazines. I rejoice in our participation in this project. Medical literature is desperately needed throughout the world and we are really the only group which can supply it to the Darien Book-Aid Plan.

In response to the excellent AMA—ERF program which emphasizes aid to medical schools and the Loan Guarantee Fund, Connecticut has exceeded all previous records. Four counties have reached the goal of $5.00 per member as set by the National Auxiliary. One county gave almost $10 per member this year. One small county gave $100 which had been in the bank in case it was needed, to the Loan Guarantee Fund, thereby making available $1,250 to a medical student, resident, or interne. One of the high lights of the annual luncheon tomorrow will be the awarding of three certificates of achievement to the counties which have been most successful.

Health Career programs have been offered in six counties with the co-operation of doctors and members of allied health fields who have participated in panel discussions following the showing of the film, "Helping Hands for Julie", to high school students. This year with two and one-half months to go 370 inquiries about eighteen different careers have already been received. The publication of the Guide Book for guidance counselors by the joint Health Careers Committees should be very helpful next year. Auxiliaries in six of the seven organized counties grant scholarship aid of more than $7300 to further careers in medicine and nursing.

Four issues of the *Connecticut Quarterly* were published and sent to each member. This worthwhile source of national, state and county news is proving to be increasingly expensive both for printing and postage. Articles of interest to the doctors have been submitted each month to CONNECTICUT MEDICINE. Subscriptions to *National Bulletin* have increased 28 per cent with almost 40 per cent of the members subscribing to this excellent Auxiliary aid.

Our representative to the Connecticut Advisory School Health Council reported that the subject of promoting better health team work in each school has been the primary concern of the council this year.

All committees essential to a smoothly run organization have functioned admirably—Finance, Hospitality, and Publicity. Connecticut was honored this year when Mrs. Morton Arnold was elected to serve as Eastern Regional Vice President of the Woman's Auxiliary to the American Medical Association and when Mrs. Paul Winslow Tisher was reappointed Eastern Regional Chairman of bulletin circulation.

To the officers and Board members with whom I have been privileged to serve, I can only say thank you for your enthusiasm and for your willingness to promote all phases of the Auxiliary program this year. Working together has been a very rewarding experience and an enriching one for me.

For the advice and help so graciously given by Dr. William Richards and the staff of the Connecticut State Medical Society, for the guidance of Dr. Clyde Deming and our three able advisors—Dr. Ralph Gilman, Dr. Orvan Hess, and Dr. Denis O'Connor, and for my husband's unfailing encouragement, understanding, and support the Woman's Auxiliary to the Connecticut State Medical Society and I, as its president, shall always be grateful.

ELIZABETH M. GARDNER

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W. B. SAUNDERS COMPANY features the following new editions in their full page advertisement appearing elsewhere in this issue:

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For catalogue and additional information, please write to Mrs. Tamar Weber, Registrar, Institute of Ophthalmology of the Americas, New York Eye and Ear Infirmary, 218 Second Avenue, New York 3, N.Y.

FIFTEENTH POSTGRADUATE ASSEMBLY of THE ENDOCRINE SOCIETY

September 30-October 4, 1963

The Fifteenth Postgraduate Assembly of The Endocrine Society will be held at Bard Hall, Columbia University College of Physicians and Surgeons, 50 Haven Avenue, New York 32, New York, from September 30 through October 4, 1963.

The General Chairman is Dr. John C. Beck, Royal Victoria Hospital, Montreal 2, Canada. The local Chairman is Dr. Nicholas P. Christy, College of Physicians and Surgeons, 620 West 168th Street, New York 32, New York.

Registration fee is $100. Registration must be limited to 250. The program will be published in the May issue of the Journal of Clinical Endocrinology and Metabolism.

Address registration fees and inquiries to Dr. Christy.

COURSE IN POSTGRADUATE GASTROENTEROLOGY

October 24, 25, 26, 1963

The annual course in Postgraduate Gastroenterology of the American College of Gastroenterology will be given at the Shoreham Hotel in Washington, D. C., October 24, 25 and 26, 1963.

This year the moderators for the Course will be Dr. I. Snapper, Director of Medical Education, Beth-El Hospital, Brooklyn, N. Y. and Dr. Robert J. Coffey, Professor of Surgery, Georgetown University School of Medicine, Washington, D. C.

The faculty for the course will be drawn from the medical schools in and around Washington. The subject matter to be covered, from the medical as well as the surgical viewpoint, will be essentially, the diagnosis and treatment of gastrointestinal diseases and comprehensive discussions of diseases of the mouth, esophagus, stomach, pancreas, spleen, liver and gallbladder, colon and rectum. A clinical session will be held at one of the hospitals in Washington in addition to the several individual papers to be presented.

For further information and enrollment, write to the American College of Gastroenterology, 33 West 60th Street, New York 23, N. Y.

New Test Reported For Penicillin Allergy

A new and safer test for determining whether a person is allergic to penicillin and other drugs was reported today by Dr. Walter B. Shelley, a Philadelphia dermatologist.

Under the new procedure, the test for a reaction is carried out in the laboratory instead of the patient, he said Only a drop of blood from the patient's fingertip is needed for analysis under a microscope, he said.

Probably the most common means of testing for penicillin sensitivity today is to inject a small amount of the drug into the patient's skin, Dr. Shelley said in the current Journal of the American Medical Association. However, even this small amount of penicillin can be hazardous for some patients and the test itself has caused occasional fatalities, he said.

Nevertheless, he said, there is a real need for such a test. The question of penicillin sensitivity arises in about 10 per cent of patients seen in practice, he said, and reactions to the drug can range from a "mild itch to death within seconds."

Although a patient's past experience with penicillin is helpful, Dr. Shelley said, this information can be misleading. Some patients may attribute symptoms erroneously to penicillin while others may become strongly sensitized without any apparent symptoms.

The blood test for penicillin sensitivity grew out of a better understanding of the allergic reaction, Dr. Shelley said.

OBITUARIES

Allan K. Poole, M.D.
1895 - 1963

Dr. Allan K. Poole, associate clinical professor of medicine, died suddenly on the morning of March 17, 1963, at the age of 67. He suffered a heart attack while making a call on a patient.

Dr. Poole had served on the fulltime faculty as instructor, then assistant professor of medicine from 1924 to 1934. His sudden death came as a shock to his many friends, including the generations of medical students he served as physician, Department of University Health, in charge of medical students, from 1933 to 1961, and whom he taught to the time of his death.

Dr. Poole was born in East Liverpool, Ohio, son of Joshua and Elta King Poole and prepared for Princeton at Lawrenceville. His college course was interrupted by Army service in World War I, but he returned to graduate from Princeton in 1919. He received his M.D. degree from Johns Hopkins in 1923. After internship at the New Haven Hospital, Dr. Poole was an instructor in medicine for a year at Johns Hopkins before joining the Yale Faculty.

Since entering the private practice of internal medicine in 1934, Dr. Poole's human warmth and love of people endeared him to his patients. A remark frequently heard from interns and residents was—"There's a man who really cares about his patients." Dr. Poole was equally devoted to his friends of whatever age, always finding time to help a younger colleague. A lasting memory will be his accounts of trout and salmon fishing, and the country, whether Connecticut or Canada, to which this major interest took him.

Dr. Poole was a member of the American Medical Association, Connecticut State Medical Society, the New Haven Medical Association, two fishing clubs, the Walton Club of Cornwall and the Potatuck Club of Newtown.

He leaves his wife, the former Charlotte Irwin, a son, Allan K. Poole, Jr., of Orange; a brother, Joshua Poole of New York City and three grandchildren.

At the end, Dr. Poole had his wish—to die with his boots on.

William E. Swift, m.d.

Walter Rowson, Jr., M.D.
1917 - 1963

Walter Rowson, Jr., was born on June 15, 1917 in Groton, Connecticut, the son of the late Walter and Gertrude Kelly Rowson, and died suddenly on February 19, 1963 at the Day Kimball Hospital in Putnam, from myocardial infarction due to coronary thrombosis. He is survived by his wife, Marietta Shaughnessy Rowson, two daughters, Muriel and Jennifer, and three sons, Walter III, David and Geoffrey.

His early education was received in Braintree, Massachusetts and he graduated from Braintree High School in 1935. He was on the baseball and football teams in high school.

Dr. Rowson received his premedical education at Bowdoin College, Brunswick, Maine, and graduated with honors in 1939. While at Bowdoin he was a member of the varsity football team, and a guard on the 1937 team that won the Maine State Championship. He received his M.D. from Yale Medical School in 1943. Following this he interned at the Hartford Hospital for a year and a half. During World War II he joined the U.S.A. Medical Corps, and served on active duty for two years in the China-Burma-India Theatre.

After being discharged from the Army as a Captain, Dr. Rowson opened an office for the practice of general medicine in Putnam in 1946. Early in 1947 he moved his office to North Grosvenordale. His winning way, fine personality and loyal devotion to his profession soon caused his practice to grow beyond the limits of his physical endurance, so that in 1951 he took Dr. Sherman L. Waldron into partnership with him.

In 1955 he left general practice and returned to Hartford Hospital as a resident in surgery. After completing his residency in 1958, he returned to North Grosvenordale and joined the surgical staff of the Day Kimball Hospital, and served there until his untimely death.

Dr. Rowson was a member of the Windham County Medical Association, and served it as clerk from 1952 to 1955. He was also a member of the Connecticut State Medical Society, A.M.A., the American College of Surgeons and was certified by the specialty boards in general surgery. He was a member of the Cornerstone Lodge A.F. and A.M. in Thompson, and the Congregational Church in Putnam, which he served as a Deacon.

Besides his keen interest in sports which included pitching softball for a local team in the summer, and golf, he enjoyed spending his few leisure minutes in restoring old automobiles. His jolly way of life and love for good jokes and stories will be missed by those who knew him best. More important than this though is the loss to the thousands of devoted patients who have looked to him for their care the past sixteen years.

Sherman L. Waldron, m.d.

Arthur J. Couture, M.D.
1905 - 1963

Dr. Arthur J. Couture was born in Moosup, Connecticut on April 4, 1905, the son of the late Napoleon and Rose Chabot Couture.

After graduating from the local grammar school, he attended Assumption Preparatory School and College in Worcester, Massachusetts for eight years where he received his B.A. degree with great distinction in 1928.

He received his M.D. at Boston University in 1933. Following an internship at The William W. Backus Hospital in Norwich, Connecticut, he opened an office on South Main Street, Mossup, Connecticut. He continued his practice in this location for 30 years until his untimely death on March 14, 1963, with the exception of four years which were spent as a Medical Officer in the United States Army during World War II. He was discharged from the service with the rank of Captain.

Dr. Couture was a devout communicant of All Hallow's Church in Moosup. He was a member of the Windham County Medical Association, the Connecticut State Medical Society, and was on the courtesy staff of The William W. Backus Hospital.

He is survived by his wife, the former Alice Jones, and one son, Paul, a first year student at St. Anselm's College in Manchester, New Hampshire.

Although Arthur Couture was an extremely quiet man, he possessed a dry sense of humor and a sincerity which endeared him to the many families he served during his lifetime. He will be sorely missed by his longtime and many elderly patients as well as by his colleagues.

E. Arthur Barry, Jr., m.d.

Mary Ward, M.D.
1912 - 1963

Dr. Mary Ward died at her home in Sharon, Connecticut, on April 20, 1963.

Dr. Ward was born in Englewood, New Jersey, daughter of the late Dr. George Harold Ward and Sarah Prentiss Ward.

She was graduated from Wellesley College Class of 1933 then took her Masters Degree in Zoology at Columbia in 1935. Dr. Ward was graduated from the College of Physicians and Surgeons, Columbia University, in 1939. She was a resident anesthesiologist at Presbyterian Hospital, New York City, from 1941 to 1943 then went into private practice in Englewood, New Jersey, for a short time; to return as head of the Department of Anesthesiology at New York Hospital (Cornell Medical).

In 1953 Dr. Ward moved to Sharon where she was in private practice as an anesthesiologist until her death.

Dr. Ward was a diplomate of the American Board of Anesthesiology, a member of the American Society of Anesthesiologists, a member of the American Medical Association, the Litchfield County Medical Society and the Connecticut State Medical Society. She was on the active staff of the Sharon Hospital.

She is survived by a brother, George Ward, and a sister, Mrs. Sally Kerr, both of New Jersey.

Robert Fisher, m.d.

Richard V. Newcombe, M.D.
1916 - 1963

On April 12, 1963, Dr. Richard V. Newcombe was killed instantly in an automobile accident. He had attended a Friday session of the New England Roentgen Ray Society in Boston, and was on his way home alone at the time.

Dr. Newcombe was born in Burlington, Vermont, September 9, 1916. He graduated from the University of Vermont College of Medicine in 1941, and served his internship at the United Hospital in Port Chester, N.Y. On completion of the internship, he entered the Army of The United States, and attained the rank of Lieutenant Colonel before his discharge in 1945.

At the end of World War II, Dr. Newcombe began a residency in radiology in the department of Hugh Hare, at the Lahey Clinic. After the residency he became a diplomate of the American Board of Radiology and joined the Lahey Clinic staff.

After one year on the clinic staff he left to become an associate and later a partner of the late Dr. Kenneth K. Kinney. Together, Dr. Newcombe and Dr. Kinney provided a considerable portion of eastern Connecticut with radiology coverage for several years. At his death Dr. Newcombe had two associates. He was radiologist in chief at the William W. Backus Hospital in Norwich, the Day Kimball Hospital in Putnam, the United States Coast Guard Academy Hospital in New London, and was an active consultant at the Norwich State Hospital, the Mansfield Training School Hospital, and at the Danielson Clinic.

Dr. Newcombe is survived by his wife Helen, daughters Beverly and Carolyn, and two sons, Vaughn and Glenn. He brought the fortunate combination of a fine mind and complete, uncompromising integrity to the practice of medicine and all contacts with his fellow man. He will always be missed by all who knew him.

Charles F. Sornberger, M.D.

In Memoriam

Geer, William A. — Stratford; Yale University Medical School, 1934; Dr. Geer served as a lieutenant colonel with the U. S. Army medical corps during World War II, 1942-45. Dr. Geer interned in gynecology at the Chicago Lying-in Hospital and in surgery at the University of Chicago clinics, where he also served surgical residency. A member of the Bridgeport Hospital medical staff, he was a consulting surgeon there. Dr. Geer was a member of the Bridgeport Medical Society, the Fairfield County Medical Association, the Connecticut State Medical Society, the American Medical Association, the Connecticut Society of the American Board of Surgeons, the New England Surgical Society, the American College of Surgeons, AOA Medical and Sigma Xi Scientific honor societies, and the Algonquin Club. Among other activities, Dr. Geer contributed scientific articles to medical journals. Dr. Geer died April 18, at the age of 56.

Good, William M. — Waterbury; Yale Medical School, 1909. Dr. Good was an eye, ear, and throat surgeon in Waterbury for 45 years. He was attending eye surgeon at St. Mary's Hospital and Waterbury Hospital for many years. Dr. Good was past-president of the Waterbury Medical Association, and a member of that association. He was a member of the American Academy of Ophthalmology and Otolaryngology, the American College of Surgeons, the New Haven County Medical Association. the Connecticut State Medical Society, and the American Medical Association. Dr. Good was a member of the Waterbury Club, the Waterbury Country Club, and the Waterbury Lodge of Elks. Dr. Good died April 7, at the age of 77.

Lewandrowski, Archy W.—Groton; Boston University Medical School, 1947. Dr. Lewandrowski served with the Army as a captain during the Korean conflict. He came to Groton in 1950 and served a one year residency at Lawrence Memorial Hospital. He was a member of the Groton Rotary Club, the New London County Medical Association, the Connecticut State Medical Society, and the American Medical Association. Dr. Lewandrowski died April 7, at the age of 45.

NEW BOOKS IN REVIEW

CURVATURES OF THE SPINE by Emil D. W. Hauser, M.S., M.D. Charles C Thomas, Springfield, Illinois, 190 pp.

Reviewed by: DENIS S. O'CONNOR

The subject of spinal curvatures has always been a poorly understood one, even in some cases by orthopaedic surgeons, so it is not to be wondered at if less specialized medical men and the persons untutored in medical subjects are hopelessly confused. This small monograph, so beautifully written and illustrated, could do much to bring about more widespread understanding of the subject.

While the title would indicate that all spinal curvatures are considered in the treatise, actually the greater part of the text is confined to structural curvatures, or scoliosis.

The causes of spinal curvatures, with the exception of so-called ideopathic type, are well understood and it is regrettable that Dr. Hauser, who obviously has been a student of the subject for many years, has not developed our understanding of this particular type of scoliosis beyond the characterization of ideopathic scoliosis as "metabolic"—a characterization which definitely points the way to an understanding of the etiology.

As in all poorly understood subjects, the therapeutic approaches have been multiple and each has its disciples.

Although in recent years, with the great advances in anesthesia and better understanding of thoracic physiology, the open surgical approach to the treatment of scoliosis has gone forward rapidly. Dr. Hauser remains an advocate of the conservative approach which in his hands apparently has worked fairly well.

The critical emergencies which are common to the treatment of scoliosis, the extended period of treatment involved, the difficulties of maintaining the correction of the curvatures, to say nothing of the expense which is well beyond the financial means of most families to meet, makes the treatment of this condition an institutional one and community financial assistance, necessary.

The early recognition of the curvature, by the family, the teachers and the general physician is essential if scoliosis cases are to be gotten into the hands of those who have the knowledge and facilities to prevent the increasing deformity.

This book deserves wide distribution as a first step in a campaign for early recognition of spine deformity.

SURGERY by Richard Warren, M.D., W. B. Saunders Company, Philadelphia and London, 1963, 1397 pp. $19.50.

Reviewed by: IRA S. GOLDENBERG

This is another comprehensive textbook of surgery, authored by Dr. Richard Warren of Harvard with the collaboration of a number of his colleagues. The surgical vista enlarges daily—Dr. Warren's picture weighs a full five pounds—and the role of each constituent grows more difficult to define. In the preface to this book the author states, "This is a book of surgery . . . undertaken to fill a vacuum . . . to a large body of physicians . . . suckled on Homans' 'Textbook of Surgery.' " The late Dr. John Homans' text certainly was a worthwhile tome and in its era filled a great need, but since its last edition was published, several other excellent and inclusive texts have appeared and this reviewer disputes the existence of a "vacuum" in the field of surgical textbooks.

The present book embraces the entire field of surgery and its specialty areas, but in a most superficial manner. It is obviously impossible to examine all the many facets of surgical theory and practice in a single volume and this shortcoming is manifest here. What should a "survey" text contain? This is an unsettled question in the minds of medical educators. Perhaps a cursory treatment of the subject is intended to excite the student to seek further facts in the specialized works listed in the bibliography, but certainly one must explore beyond Dr. Warren's pages to secure more than a glance at any one area of surgery.

The craftsmanship of this book is commendable, but the author fails to utilize photographs of patients displaying the pathological entities or reproductions of pertinent roentgenograms. Line drawings of patients and roentgenograms are excellently executed, but fail to illustrate as effectively as would the photographed "real thing."

The development of the academician seems to progress through several stages of authorship: original research; surveys of his field of special interest; editorials; and, finally, a textbook. The latter often appears in its chronological place only to complete the sequence and not to make a positive contribution to our store of knowledge.

CURRENT DIAGNOSIS AND TREATMENT by Henry Brainerd, M.D., Sheldon Margen, M.D. and Milton J. Chatton, M.D. Lange Publication, California, 1962, 658 pp. $8.50.

Reviewed by: LOUIS H. NAHUM

This book is the product of experience gained by the authors at the University of California School of Medicine at San Francisco. In the first pages are found normal values of blood estimations of practically all substances from hormones, organic and inorganic ions. In the last pages are desirable weight tables, liver function tests, miscellaneous urinary excretion of aldosterone, catecholamines follicle stimulating hormones, hydroxycorticoids ketosteroids, lead, and normal cerebrospinal fluid valves. There are also valves of various renal functional tests.

The book is intended to serve the physician as a useful desk reference on the most widely accepted techniques currently available for diagnosis and treatment. There is present diagnostic essentials, definition of disease entities, brief discussions of etiology, pathogenesis, clinical findings, differential diagnosis, complications. There is also covered the course, the prognosis and treatment of disease as well as the therapeutic advances. Clearly it is not a substitute for a comprehensive textbook of medicine but it is a quick reference book which should direct the doctor to further reading.

Aside from internal medical disorders, there are included also separate chapters on the eye, the ear, nose and throat, obstetrics and gynecology, breast diseases and even psychiatric disorders.

The advances in medical therapeutics are taking place so rapidly and many concepts are changing so fast especially in the area of drug evaluation that the authors promise a revision of this book every January of each year.

There are twenty-eight chapters on every part of medicine including diseases due to physical agents and poisons. An appendix dealing with unestablished drugs, chemical analysis of blood and body fluids and physical management of the hemiplegic is then followed by a voluminous index.

Nothing of any importance has been left out and the coverage is both abbreviated and at the same time thorough. There are thirty-two associated contributors of nationally known fame who have made this book a first class reference guide in diagnosis and treatment. There is no one who cannot benefit from its contents in everyday practice as well as in hospital practice.

PYE'S SURGICAL HANDICRAFT: Volume II, 18th Edition, Edited by Hamilton Bailey, F.R.C.S (Eng.), F.A.C.S., F.R.S. (Edin.) and James Kyle, M. Ch. (Belfast), F.R.C.C. (I.), F.R.C.S. (Eng). Williams and Wilkins Company, Baltimore, Maryland, 1962, 424 pp., $8.50.

Reviewed by: JAMES R. CULLEN

This is a first attempt at a second volume to a well known surgical textbook. The book is a compilation of various thoughts of 34 authors drawn from three continents. It is specifically designed for the general practitioner, the house surgeon, the intern and the surgical nurse.

The textbook covers various aspects of anesthesia, fractures, minor surgical procedures, the treatment of certain abscesses, hand trauma and infection. Several sections on the performance of routine diagnostic procedures are also included as well as sections on the emergency treatment of the more common EENT problems and the treatment of more common venereal diseases.

The authors have generally succeeded in achieving their aims, and although one may not concur with all of their therapeutic principles, nor find each chapter of value to himself, the total knowledge gained by perusal of this textbook should undoubtedly prove valuable.

MODERN NUTRITION IN HEALTH AND DISEASE by Michael G. Wohl, M.D. and Robert S. Goodhart, M.D. Lea & Febiger, Philadelphia, Pennsylvania, 1960, 1152 pp.

Reviewed by: LOUIS H. NAHUM

"Man ist was er isst."—*Goethe.*

The fifty-five contributors to this book are all authorities in their fields and the diverse material which they have produced has been so well integrated that the book actually represents a cooperative effort successfully achieved. In this second edition, after five years, the rapid advances which have been and are being made in this field are all present. In the revision much deletion and even more additions have been made. There are two entirely new sections, one on chemical and other additives to food, and one discusses dietary factors in the production of atherosclerosis and coronary artery disease.

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The thirty-eight chapters are divided into three sections, normal nutrition, nutrition in disease, and nutrition in periods of physiologic stress. The philosophy of the authors is that the maintenance of optimal health and the prevention and treatment of disease rests upon a knowledge of nutrition. For this reason the editor throughout has been concerned with presenting the basic knowledge of nutrition and its application to the practice of medicine. The approach has been the clinical point of view throughout. Body composition, hormonal control of metabolism, physiology and psychology of hunger, anti metabolites, principles of dietotherapy, nutrition and ophthalmology are but a taste of the deep knowledge available in this book to the student and physician.

There is a thorough treatment of the relation of nutrition to infection. This chapter is divided into two parts, nutrition and natural resistance to infection, and nutrition in relation to acquired immunity. Also included are the Canadian dietary standards for adults and children as well as the National Research Council recommended daily dietary allowances. Also the original chapter in the first edition on Principles of Emergency Feeding has been revised and expanded to include current recommendations on minimal nutritional allowances by both the Office of Civil Defense Mobilization and the Office of the Surgeon General, U.S. Army.

A successful book on nutrition should present an authoritative and up-to-date discussion of every aspect of nutrition and provide the practicing physician and the student of medicine with a sound knowledge of current advances in and the practical application of that science.

Nutrition is the science of food in relation to health. The food we eat and do not eat has much to do with health. In fact with the advances in the control of many of the infectious diseases, nutrition is probably the single most important environmental factor affecting our health. Correct application of nutritional principles can mean less cardiovascular disease, less tooth decay, fewer kidney and bladder stones, less iron deficiency anemia, better control of diabetes, quicker recovery from acute disease. Correct nutrition is an important aspect of physiotherapy in rehabilitation. It is the key to some of the hereditary or unborn errors of metabolism. It can lead to improvements in which nutrition plays an important role. This book will be a source of inestimable value and one to which every physician can refer to constantly.

MEDICAL STATE BOARD QUESTIONS AND ANSWERS by Harrison F. Flippin. W. B. Saunders Co., Philadelphia, Pennsylvania, 1962, 507 pp.

Reviewed by: LOUIS H. NAHUM

This book by Professor F. Flippin was first gotten out fifty-five years ago and it is now in its 10th Edition.

It fully realizes its objective of presenting to the medical student reliable up-to-date medical information in convenient concise yet generally adequate form. It has been kept up-to-date by including the newly recognized diseases such as pulmonary alveolar proteinosis adenoneural ECHO and respiratory syncitial viral infections. It considers the new antimicrobial agents such as synthetic penicillins, vancomycin, amphotericin B, griseofulvin. It also includes oral antidiabetic componds, thiazide derivatives, synthetic adrenal cortical hormones, extracorporeal dialysis, selection of patients for cardiac surgery, new experience on anticoagulant therapy, new techniques for tissue transplantation and improvement in synthetic prothesis. Problems of ionizing radiation and disorders associated with travel are also present. It is inevitable that some newer developments are missing such as triiodothyronine as a thyroid gland hormone, the role of parathormone in calcium adsorption from the intestinal tract and erythropoietin as the hormone of red cell production. There are others too, and it would be desirable for the student to use this book and not as an end in itself but as a help to be documented by his referral to his notes and textbooks. With this understanding, this book should be of inestimable help to all those preparing for state boards. The index at the end of this book has been meticulously prepared and greatly enhances the usefulness of this book. This reviewer believes the general physician could and should use this book as a quick reference book. He would be highly rewarded in his practice by frequent reference to its pages.

DIFFERENTIATION BETWEEN NORMAL AND ABNORMAL ELECTROCARDIOGRAPHY by Ernst Simonson, M.D., C. V. Mosby Co., St. Louis, Missouri, 1961, 328 pp., $13.50.

Reviewed by: LOUIS H. NAHUM

The first communication on the normal electrocardiogram was by Lewis and Gilder in 1912. This, of course, dealt with three limb leads. In 1951, Ziegler, in a detailed monograph presented the range of the normal electrocardiogram in children. Now after ten years Simonson and his colleagues have collected the range of normality in 960 normal people after studying seventy-five items in their electrocardiograms, summarizing a total of 70,000 measurements. The result is a compilation of what is a normal electrocardiogram, a most difficult question to get an answer to. It involves a statistical definition of a normal range. The vicissitudes of sampling, technical and biological sources of variability error of measurement, and the matter of repeatability are all considered in lucid detail.

As though this were not enough, Dr. Simonson has gone on to define the normal response to a variety of stress tolerance tests such as the anoxia and exercise tolerance tests. He has also gone on to define the limits of many parameters as measured in the vectorcardiogram, though this practice is extremely limited and not likely ever to reach the experienced electrocardiographers.

Every experienced electrocardiographer is always asking himself the question as to what extent does the record tend

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CONNECTICUT MEDICINE / *editorials*

A Generation Of Hypertension

We know so much now about hypertension, how to cure some of it, how to ameliorate some of it, that some might ask why we should bother to go back a generation and see what we thought of hypertension then. Because understanding the past can open for us the future. Because it can teach us valuable lessons, that would deepen our understanding of the problem as it exists today, finally history is of interest because it contributes to making an educated man and besides it is fun. In the struggle to understand one disease hypertension we can learn much about man's progress in mastering disease in general.

A generation ago many physicians firmly believed that high blood pressure should not be lowered. The reason given was that a low blood pressure would reduce the perfusion of the kidneys and result in uremia. This medical dogma provided a useful exercise and maintained the physicians peace of mind especially since there was no available means of lowering arterial pressure. The same dogma operates to some extent even today in the fear expressed by some doctors that lowering arterial pressure will compromise cerebral and coronary blood flow. Once urea clearance became a means of measuring renal flow the dogma vanished because renal flow was well maintained after arterial pressure was lowered by, of all things colloidal sulphur. An elevated arterial pressure was not essential for renal perfusion! The kidneys possessed a remarkable capacity to adjust to changes in perfusion pressure!

The next step in the story of hypertension was the result of a chance observation by Alfred Adson who noted a sharp drop in arterial pressure in a hypertensive patient upon whom he performed an anterior rhizotomy. This was communicated to Page[1] who directly furnished a patient with malignant hypertension to George Heuer for a similar operation since they knew how hopeless the outlook in such cases would be otherwise.

Interestingly, the patient survived the "yard long" laminectomy. His retinopathy disappeared, the heart was reduced in size, inverted T waves in the electrocardiogram reverted to normal as the blood pressure came down! As Page says "this was the first reversal of malignant hypertension ever seen and to do it the medical people used a surgeon as a journeyman." It was not the last time either, although surgeons became students of hypertension and performed many sympathectomies since on hypertensive patients.

With the introduction of drugs, gradually the surgical treatment was often replaced although the story of drug treatment of hypertension is long, tortuous filled with complications and distress to both patient and physician. We created new diseases for every new hypertensive drug. In disappointment either the doctor or the patient abandoned therapy and the patient preferred to live with his hypertension. As Page points out "The early ganglion blocking drugs produced patients exhibiting maximum entropy. Their world turned cold and all but lifeless. Sympathetic function was suppressed, which was the mechanism of their antihypertensive effect, but it was the parasympathetic paralysis that was deadening. Patients breathed but the mouth was so dry that food was tasteless. They could not read because near vision was paralyzed . . ." They had atony of the stomach intestines and urinary bladder and were impotent." It was a way of life but that was about all."

Many, however, did not experience such paralyzing effects and were relieved of the complications of hypertension. Newer drugs such as hydralazine and reserpine broadened our approach to the mechanism of hypertension. When chlorathiazide was introduced, a powerful synergistic action of this diuretic with other antihypertensive drugs was placed at our disposal. This was a happy circumstance since it allowed us to reduce antihypertensive drugs to amounts that did not produce side effects that were troublesome, effects which previously we had come to accept as inevitable.

It is now about twelve years since the first patients were treated with drugs with some degree of effectiveness. We are at the threshold in which good blood pressure control should be the rule, not the exception. It is possible to accomplish this with a minimum of discomfort to the patient and disruption of his life. What is even more important is that some cases are reported in whom the blood pressure did not return to previous hypertensive levels after they have been in good control for several years with drug therapy. There is thus the glimmer of a possible cure which should have great psychological value for the hypertensive patient and encourage him to pursue his therapy with persistence.

In 1934 an important contribution towards understanding hypertension came to us from the classic researches of Goldblat, which showed that renal artery constriction produced hypertension in the dog. It was the first recognition of a form of hypertension now called renoprival due to a disturbance of the blood supply to the kidneys. Clinical experience that followed quickly upon Goldblat's discovery was disheartening because only in about one quarter of such patients was arterial pressure lowered by nephrectomy. It is now apparent that such poor results were due to inability to properly visualize the renal arteries and insufficient knowledge as to how to interpret the intravenous urogram.

The development of renal angiography as a feasible and safe procedure has been a major methodological advance in the field of clinical renal hypertension and the simultaneous development of arterial grafts to replace or bypass renal artery stenosis has in turn been an important stimulus to encourage the search for those cases of hypertension in which occlusive renal arterial disease can be properly recognized. It is clear enough now that renal artery stenosis is a significant cause of hypertension, and that it produces certain urographic abnormalities and certain disparities in function of the two kidneys which should be sought for, since restoration of renal blood flow can lead to disappearance of the hypertension in some instances.

Renal Angiography however, is not a routine test and some guide lines are necessary for selecting patients on whom it should be done. These have been well summarized by Page.[1] When one kidney is longer by lcm. or more than the other when concentration of the radiopaque medium is different in one kidney than in the other, then the hypertensive patient should have angiographic studies. Since sometimes venographic films are not adequate for evaluation for angiography certain clinical features assume importance. Of these, malignant hypertension, sudden onset of hypertension after age 35; hypertension under 35; finally when hypertension is present for more than one year with sudden increase in the severity of the vascular disease, then angiographic studies are justified. These clinical features and urographic signs should direct our attention to associate hypertension with renal artery stenosis, for only in 2 per cent of hypertensives in whom they were lacking were renal artery lesions found.

If a patient has renal artery stenosis one should bear in mind that operations on renal arteries carry a risk. This is especially true in patients with diffuse atherosclerosis. In patients with segmental renal atrophy that already suffer from azotemia because of nephrosclerosis in the rest of the renal tissue, the operation cannot be helpful. In such patients much can still be gained by use of antihypertensive drugs if the hypertension is severe enough to warrant their use.

When everything is said and done our understanding of the vascular disease associated with hypertension is still primitive. We have some indication of the nature of the many mechanisms involved but knowledge is still fragmentary. We know some types are reversible. We can treat the high blood pressure in many cases fairly effectively and we are finding criteria for the various types of hypertension. How far on the road to a complete solution of the hypertension problem have we travelled in the last generation? Page thinks about one quarter of the road. Nevertheless it is heartening to think that the course of a modern lifetime can span the formulation and at least partial solution of one of the most important health problems of mankind. It proves that all the experience of the past led us only to dogmas. That only by scientific investigations into the mechanism of hypertensions are we being provided with an understanding of the mechanism of the disease. Many ingredients are already known and there will be more to come, but only through the method of science.

L.H.N.

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Potential Preventability Of Rheumatic Fever

Rheumatic fever is still a significant crippler and killer of children and adults exacting a greater toll than poliomyelitis. Rheumatic fever is preventable. Why then do we have it? It is not due to any scarcity of knowledge that acute infections with Group A-β hemolytic streptococci of the throat and respiratory tract is the antecedent for rheumatic fever developing. It is not due to any lack of knowledge that such an infection can be cured by appropriate therapy with penicillin. It is not due to our inabilty to correctly diagnose the presence of Group A-β hemolytic streptococcus in the throat of a child suffering from a sore throat. It is not due to inactivity on the part of the American Heart Association on circularizing our profession on the prevention of rheumatic fever and bacterial endocarditis through control of streptococcal infections first in 1955 and again in 1960.[1] What then is it due to?

A study of this question by Czoniczer et al in 1961[2] and by Grossman and Stamler this year[3] helps to focus on the defects in our approach and where we tend to go astray. The occurrence of subclinical streptococcus infections which have minimal or no antecedent symptoms or signs but which result in rheumatic fever is and will always remain a problem. The patient does not know he is sick and does not consult a physician. However, this is a small number, 16 out of 110 cases. Ninety-four had a history of an antecedent infection and 84 were respiratory in nature including a high percentage of sore throats, cervical adenitis, and scarlet fever. Of these only 62 were taken to a physician. While this may be regarded as representing a relatively high rate of medical care, it still shows that one-third of the parents failed to bring their children to the doctor for diagnosis and treatment of an acute respiratory infection. Clearly we have here an obvious proof that further public education is necessary to minimize the hazards in the form of rheumatic fever and rheumatic heart disease that follow acute streptococcus sore throats.

Timely diagnosis makes possible effective therapy. It is therefore, interesting that Grossman and Stamler report that some physicians have not as yet been convinced of the necessity for throat culturing in children who suffer from respiratory infections. Nevertheless to avoid unnecessary antibiotic therapy an accurate diagnosis of Group A, β hemolytic streptococci in the throat is essential, for it is on this basis that effective therapy to eradicate this infection can be instituted with antibiotics. Only 17 per cent of 62 patients admitted to the hospital with the first attack of rheumatic fever received a throat culture and only 6 of these were reported positive. Properly cultured all the throats of the 17 should have been positive for hemlytic streptococci. Clearly adequate techniques had not been utilized in swabbing the throat, selecting the media, plating the cultures and reading the plates. Even in the six patients with a positive culture for hemolytic streptococci, the organism responsible for acute rheumatic fever was identified in only one instance. It is unmistakeably clear from these data, that improvement is sorely needed in the procedures used by physicians and laboratories for culturing group A-β hemolytic streptococci.

Once an accurate diagnosis has been made, the next problem is how to determine what is sufficient therapy. It seems from Grossman and Stamler's study that some physicians treating children with respiratory infections are apparently not adhering to or familiar with the recommendations of the American Heart Association with respect to type of therapy, dosage and duration, that is essential to eradicate the Group A β hemolytic streptococci and to prevent rheumatic fever. They made the significant observation that in ten cases the recommended penicillin dosage and duration of therapy was followed, but was not effective to prevent rheumatic fever. Apparently larger doses than those recommended are needed. The experience in the La Robida Sanatarium is that a combination of procaine penicillin (600,000 units) and benzathine penicillin (600,000 units) is apparently completely effective when given on the initial diagnosis of acute respiratory infections due to the specific streptococcus and repeated in four days.

Czoniczer et al[2] have reviewed their experience in Boston with 105 patients admitted to the House of the Good Samaritan with the first attack of rheumatic fever and found that not a single patient had received adequate penicillin therapy at the time of the antecedent streptococcus infection. Of the total of 105, 69 patients had not even consulted a physician at the time of the primary infection. When one considers that at least half of the rheumatic fever patients develop residual cardiac damage at the time of discharge from the hospital,[3] it becomes apparent how essential it is to identify the causative organism of a respiratory infection and how important it is to administer adequate therapy to those patients whose infection is caused by Group A β hemolytic streptococci.

Now that adequate measures are available for therapy, the incidence of acute rheumatic fever should decline and hopefully disappear. It seems appropriate to recommend vigorous efforts by public health agencies, professional organizations and individual physicians to achieve this "potential preventibility."

L.H.N.

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Allergy, Histamine, And The Basophil

There is an ever increasing number of new drugs, almost all of whom in some patients at some time can produce an allergic reaction. This may occur in nearly any organ, and range in severity from a mild itch to death within a few seconds. The allergic reactions are remarkably diverse. In the skin, it produces pruritis and urticaria, erythema multiforme, atypical lichen planus, erythema nodosum or even exfoliative dermatitis. Similarly, edema and inflammatory lesions are seen in the mucus mem-

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branes. It appears that these lesions result from a continuing allergic release of histamine from the mast cells in the skin. The pulmonary findings also reflect the effects of histamine release, such as asthma, pulmonary edema, and even Löffler's syndrome. We all know that the blood can show an astonishing reactive eosinophilia, a marked thrombocytopenia, leucopenia or anemia.

As many as 10 per cent of the patients seen in practice today claim to have sustained a presumptive penicillin reaction at one time. Fundamentally such intolerance is the result of an immediate type of allergic hypersensitivity. Fever, fatigue and nausea may be minor notes of the reaction, but there are also more dramatic findings, those of a histamine-shock state called anaphylaxis. It is obvious that if penicillin were withheld in those patients who have become sensitized to it, the serious immediate anaphylactic reactions could be avoided, although we must not forget that every exposure of penicillin still carries an unpredictable threat of possible sensitization or resensitization.

How is the clinician to discern which of his patients are sensitized to penicillin or for that matter to any other drug or allergen? Of course, a carefully secured history is of the greatest value here, but at times this is misleading since a patient may attribute hives from any cause to the penicillin. or other drug merely because he was also taking penicillin. On the other hand, many patients while taking penicillin showed no sensitivity, but became strongly sensitized afterwards without any clinical evidenec of it, unless they receive it again. Of course, we cannot minimize the historical approach which must be respected, but there remains a real need for an objective method to determine the allergic status of the patient.

Probably the most popular diagnostic technique has been the skin test in search for the sensitized individual not merely to penicillin but to a wide variety of other allergens. The intradermal introduction of a small amount of penicillin is followed by a local flare and hive and on occasion a drop in the platelet count. This method is unsatisfactory because of false negatives and false positives. A more serious objection is the hazard of introducing even a small amount of penicillin into a highly sensitized patient and occasional fatalities from the skin test alone have been recorded. To obviate hazards of this kind various modifications of the procedure have been tried even using a synthetic penicillin antigen, hemagglutination techniques and the passive transfer of the antibodies in the patients serum to a healthy volunteer (Prausnitz-Kustner test.) But all these methods are time consuming awkward and carry the threat of transferring serum hepatitis. It is clear enough that a laboratory test is needed in which the patient is not the subject but merely his serum, to be tested for the presence of antibody.

The classical intradermal test is assessed by the degree of urticaria which results from a change in capillary permiability, caused by release of histamine from the mast cell in the skin. This cell has turned out to be the major cell for the mediation of all types of immediate allergic reactions. When the mast cell is observed directly it loses its histamine containing granules in the presence of an antigen-antibody union. More recently the other half of the mastocyte-basophil system, the basophil cell, has been found to participate in the allergic reaction and to serve as a new immubiologic tool for the study and detection of such allergic states. The basophil cell is a readily identifiable cell which can be observed to release its histamine containing granules during the antigen-antibody union. Thus throughout all of the allergy tests runs the histamine thread of continuity. When the histamine granules are seen to be released, then the patients serum contains circulating antibody.

Shelley has found that the basophil provides a superior method for detection of circulating antigen. The cells are easily obtained from a patient and brought into view in adequate numbers under the microscope. This at once removes the patient himself as a test animal and spares him the risk and annoyance of skin testing. If the patients basophil level is too low, especially during an allergic or toxic reaction one can readily secure a good number of test basophils from the rabbit which respond as well as the patients own basophils to the antigen-antibody union. The test itself is physiologic, since it is based on a clinically operative mechanism which has been well validated in animals.

A negative test indicates the absence of antibody on the day of the test. It does not mean that antibody will not appear a week or two later, for often after a severe allergic shock, there is no antibody circulating for one to two weeks after which it might appear in high concentration. A negative test does not distinguish between a person who was never sensitized to a drug like penicillin or one who has lost the sensitization which he had several years before. A negative test can also be found in the presence of high dosage of steroids. In short, what a negative test means is that on this day, he will not react allergenically if the drug is given.

A positive test simply means that there are present circulating antibodies of 1:100 up to 1.1,000,000 and the degree of sensitivity will require further quantitative data. It should be noted that in addition to the presence of antibody many other factors enter into a determination as to whether a given patient will experience clinical anaphylaxis. These

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are the total basophil count, the histamine content of the basophils, and the patient's vascular sensitivity to histamine.

Shelley reports the results of testing 275 individuals with penicillin reactions and found only four showed sensitivity out of seventy who had recently received penicillin without apparent incident. Out of 138 individuals with a history of penicillin intolerance, sixty showed a positive test while seventy-seven were non-reactive. It is comforting to know that in general, patients who showed positive reactions to penicillin over two years ago showed negative tests. Especially interesting were his findings of cross sensitivity. It appears that what patients develop sensitivity to, is the nucleus of the penicillin molecule 6-APA and that sensitivity to one type of penicillin means sensitivity to all types. He also found that antihistamines upon which there has been much reliance in treating sensitivity are without effect but that steroids in adequate concentrations had an immediate effect.

By this method Shelley found it possible to detect regularly any allergy to horse serum, pork, and egg, which appears in certain vaccines. The use of the basophil test should greatly facilitate screening of potential compounds as well as permit more precise definition of the exact molecular configuration of 6-APA responsible for penicillin antigenicity.

The basophil test affords an opportunity to re-evaluate old drugs and search out new ones for the treatment of anaphylaxis. For example, epsilon amino-caproic acid in 1 per cent concentration blocks the allergic basophil degranulation. Without doubt, continued observations in this field should be most fruitful, for some patients reporting sensitivity to penicillin may really only be suffering not from allergy to the drug itself, but to a coloring or flavoring agent with which it is prepared.

Finally, it should not be forgotten that in addition to systemic drugs local eczematous contact type reactions to drugs can also be detected by virtue of an associated immediate type sensitivity with circulating antibodies. Thus Shelley has detected and documented contact sensitivity to penicillin, neomycin sulphate, streptomycin and mercury.

We are at last in possession of a test for allergy which frees the patient from annoyance of skin testing. It is precise and quantitative, and opens a whole new field for research in drug allergy and avoids the unpleasantness and at times real danger of discovering the sensitive patient as well as the offending allergen.

L. H. N.

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Pitfalls In Tetracycline Therapy

The discoveries of sulphanamides and antibiotics have ushered in a new era in which countless lives have been saved. At the same time we have come into a new belief in active and potent agents for all infections and some of us are unhappy merely to observe the patient and allow him unaided to overcome a mild infection. In fact the use of antibiotics has become so widespread as to make some of us forget about the "vis medicatrix naturae."

In a previous generation most of the physicians had a horror of any treatment which might harm the patient and it was considered wrong to prescribe merely for the sake of prescribing. The guiding principle was "Primum non-nocere," above all do not do harm. This eternal truth seems to have been pushed back into the limbo of our thinking for a time. We are only now beginning to emerge from the first enthusiasm with which we greeted the discovery of the antibiotics and as we learn more of the late effects our belief in potent agents for infections is being tempered by a more mature and critical attitude and the reemergence of the guiding principle primum non-nocere."

In balancing the effect of doing good, versus that of doing harm, the wise clinician allows for the "unknown factor" or those aspects of drug toxicity which still require further elucidation. An ideal antibiotic of course, would be one that would lead to a complete destruction of the invading organism and a complete lack of effect on the host. We know now that this ideal has not been reached and it may be that what we have achieved approaches a practical limit. As our experience with each therapeutic agent grows we find that they each have their own peculiar set of effects in the host. With penicillin the allergic mechanisms appears to be the achilles heel, because, unless the non allergic patient has renal disease he can tolerate much larger quantities than the maximum therapeutic amount employed.

Perhaps the antibiotics with the best record are the tetracyclines in which serum concentrations of over 120 ug. per m.l. may be the dangerous range. But these concentrations are rarely reached except in renal disease and from the practical standpoint the serious side reactions are more related to the over-all microbiologic effects with the occurrence of super-infections such as staphylococcus and yeast enteritis. But the effect of these agents upon the microorganism should make the thoughtful physician wonder whether the antibiotic does not also enter into the basic metabolic reactions of the human body. It is known that the mechanism of antibacterial activity appears to be the arrest of protein synthesis and a failure of microbial multiplication and metabolism. Why then cannot this

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agent have a similar effect of blocking protein synthesis in man? There are many suggestions in the literature that this in fact is true. In undernourished men there has been found weight loss and increased urinary excretion of nitrogen, a less positive or even definitely negative nitrogen balance and at the same time a markedly increased loss of riboflavin in the urine.[1]

There are some studies which suggest that such catabolic effects of tetracycline are clinically important. Bateman[2] noted in seven mildly azotemia patients that the use of tetracycline caused a marked rise in the N.P.N. They died and death was felt to be related in part to the use of the antibiotic. Five other reports contain evidence that the phenomenon does have clinical importance particularly with respect to renal failure. Shils[3] careful study supports this view and indicates the need for care in the use of these drugs in patients with kidney disease. His patients suffered from anorexia, nausea, vomiting, weight loss and increase in N.P.N., hyperphosphatemia and acidosis associated with increased excretion of nitrogen and sodium. It appears that the N.P.N. accumulation is due both to a decreased utilization of aminoacids in protein synthesis, and increased protein breakdown both liberating nitrogen products which in the presence of renal disease cannot be readily excreted to keep the N.P.N. down. If tetracycline prevents protein synthesis, then an anabolic steroid norethandiolone should reverse the process and it does. If riboflavin is excessively excreted in the urine during tetracycline administration, then riboflavin deficiencies should be a part of the clinical syndrome developed during the use of this antibiotic. This in fact is the case since patients with renal disease receiving tetracycline show cheilosis, and even exfoliation of the mouth mucus membrane a most distressing and debilitating complication.[4]

The fact that renal insufficiency tends to increase the tetracycline serum concentration because it cannot readily be excreted, requires an appreciable reduction of the dose to prevent the catabolic effects and the development of azotemia and the other now recognized complications. As with many other drugs primarily dependent upon the kidney for their excretion, discrimination and care in the use of tetracycline are indicated in patients with renal impairment.

Lepper[5] suggests that the dose in patients with reduced renal function should be in the range of no more than 0-5 gram per day, and in more severe degrees of renal disease this dose should be given only every second or third day.

While the chemical and metabolic abnormalities described are reversible with proper care, the resulting morbidity, prolonged hospitalization and delay in performing necessary medical procedures may at times be considerable. When significant chemical and metabolic abnormalities have occurred as a result of overdosage with tetracyclines, it is not enough to promptly discontinue the drug, but to decrease the proteins and provide for adequate calories, fluids and electrolytes. At this time, a trial of an anabolic steroid is certainly warranted. Since testosterone helps to enhance protein synthesis, it should be tried in appropriate situations.[6]

We still need to know whether factors other than renal function and serum tetracycline levels influence the degree of chemical and biochemical changes that may occur in a given individual in response to tetracycline. We still do not know whether the organism adapts to the metabolic effects if intake of the antibiotic is prolonged. It would be worthwhile to obtain further data on the clinical significance of the tetracycline-anabolic steroid relationship and the mechanism of action. One must even consider the possibility that the toxicity of the drug may be enhanced if it is not properly kept, since Gross[7] has reported a case in which altered tetracycline probably caused renal tubular damage.

The similarity of biochemical processes such as protein synthesis in bacteria and mammals makes the chances slim of finding an ideal antibiotic which kills the invading organism and leaves the host unaffected. Fortunately, however, the differences of action upon bacteria and man are sufficiently great so that highly favorable therapeutic ratios can and do exist. But we must beware of the situations in which the dangers of toxicity are present, especially renal disease. The wise clinician knowing the biochemical action of tetracycline, will anticipate the problems and avoid the pitfalls.

L. H. N.

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Revolution In Biology

Medical practice has been profoundly shaken by chemotherapy, because this great tool has virtually eradicated a whole host of mankind's scourges. The result has been prolongation of life beyond anything anticipated at the beginning of the century. Gradually the physician has been forced to deal with the frustrating problems of degenerative, mental and metabolic diseases, which at present he sees in stages that are already for the most part irreversible. It is therefore, not surprising that there has been a vast increase in research directed towards solving of these problems and a tremendous increase in masses of data and facts, gained by techniques, methods and language quite unfamiliar to the doctor. Data by themselves, without a new scheme of thinking about them, can be both frustrating and confusing. We need only to recall the bewildering array of seemingly disconnected facts in the organic world before Darwin brought order out of chaos by his theory of evolution. To recognize our present state in medicine, we need a way of thinking about medicine with which we have not been provided by our medical education.

During the last decade both the tempo and intensity of change accelerated, and seemed to lead to more and more complexity. The complexity led to confusion. Some unifying principle is necessary to give us an entirely new and comprehensive basis for understanding of disease. As is so often the case a careful perusal ofthe historical evolution of our present intellectual and practical plight becomes a necessary prelude to the formulation of a unifying principle. Vallee and Wacker[1] point out that the complexity and the ensuing confusion are but phases of transition in the development of an entirely new and comprehensive basis for the understanding of disease.

Over one hundred years ago it was the cell theory that was the most important advance in fundamental biology. Many of us are still in the "cell" stage in our thinking. Without doubt cellular pathology was intellectually simple and this made it understandable and useful. The light microscope on which it was based extended are senses and made the knowledge accessible to every student. The fear that the new science would jeopardize observation at the bedside and hence impair the proper care of the patient was dispelled, when with the aid of the new thinking, great bedside physicians who were also pathologists like Osler and Blumer flourished. In fact the physician with the microscope became the symbol of medicine, and epitomized the relationship between clinical medicine and its biological basis.

In the last two decades we have begun to see that the cell is not the real unit in biology, but a complicated laboratory made up of membranes and component molecules, and that we must include an understanding of the molecular events in the cell in order to reason about disease. There has grown up a need to identify "the molecular nature of cellular aberration." But studying molecules requires new instruments, diverse, and complex of which electrophoresis, ultra-centrifugation X-ray crytallography electron microscope are but a few. All require insight into the forces that govern the formation and fashion the structure of molecules. But structure of molecules is not enough. The biologist must depend upon how they behave, therefore, he becomes an immunologist and enzymologist to discern their function.

Paul Ehrlich[2] established the beginnings of immunochemistry and chemotherapy. It was he who postulated specific points or areas of chemical affinity in antigen and antibody which he called side-chains, a concept he later extended to the interaction of drugs with specific sensitive receptor molecules. The result of his epochal hypothesis in terms of therapeutics, and its impact on the development of modern subcellular and molecular biology were very far reaching and have not yet reached their magnitude. The detection of specific chemical reactions led to the discovery of pathways of metabolism, controlled by specific enzymes at each step. Sumner's[3] discovery thirty-five years ago that enzymes were proteins, laid the foundation for recognition of normal and abnormal pathways of metabolism. It made possible intimate correlation between function and structure of enzyme molecules and this in turn led to new insights which clearly established the study of disease and its treatment not through microscopic histology but through molecular biology.

The first indication of molecular pathology was derived from studies of the difference in the hemoglobin molecule that is found in sickle-cell anemia or S hemoglobin. This molecule differs from adult hemoglobin simply by a replacement of a valine for one glutamic acid residue in each β chain of hemoglobin.[4,5] This alteration in the hemoglobin molecule introduces two positive charges, changes its solubility under conditions of reduced O_2 tension, causes a change in the shape of red cell, (sickling) and widespread capillary clumping of the red cells. They are then removed by the reticulo endothelial system and hemolytic anemia results. This discovery demonstrated for the first time a chemical expression of a genetic defect, a study of the genetic code and recognition that replacement of a pyrimidine for a purine base causes the faulty instruction of protein synthesis leading to a sickle cell anemia! This one discovery has been the source of a torrent of new insight generating virtually a new field within hematology.

In the biology of gout we see exemplified another instance of interdependence between Biology and Medicine.[6] Once gout was considered to be the result of over ingestion of purines, and its treatment relied upon limiting purine intake, a quite unsuccessful approach. Now we know that in many individuals primary gout is brought about by the direct over synthesis of uric acid which gradually increases the total body uric acid pool because renal excretory capacity is limited. Because uric acid is sparingly soluble it begins to precipitate in areas where chemical environment favors precipitation such as joints bursae, cartilage, bone, tendons and kidney collecting tubules. Clearly the treatment requires increased excretion of the uric acid by available agents such as probenecid. This application of fundamental biology has led to prevention and treatment of a disease with a previous hopeless prognosis. Phenylketonuria,[7] galactosemia and numerous other genetic defects have been solved by techniques of molecular biology and emerging is a clear recognition that the phenomena of normal and abnormal biology are based on simple laws that govern the composition, structure and function of the molecules of cells.

The discernment of the details of the genetic apparatus, of the apparent universality of the genetic code and of the manner in which proteins and therefore enzymes are formed and function are but a few of the brilliant examples of the understanding with which medical problems can be approached. The physician can apply the achievement of molecular biology to his practice if he understands and thinks of disease at the molecular level. He will learn to detect functional changes before structural changes have taken place and in this way his ability will grow in preventive and curative measures. "Yesterdays knowledge and insight cannot be used to solve tomorrow's problems. Todays physician must transcend the limitations of the past. Those who serve its aims must pioneer its transition into a new era holding untold benefits for mankind,"[1] the era of molecular biology.

L.H.N.

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Dangers In Polypharmacy

Many physicians are aware of the simple principle that when a patient needs two or more powerful drugs, it is sound practice to administer them independently for then the dosage of each can be adjusted to the response of the individual. It is safe to say further that there are few patients who are receiving less than two drugs in their therapy. To what extent however, are we all laboring under the belief that the drugs act independently of one another. Do we think often enough of the well known concepts about drugs developed in pharmacology synergism, contra-indications, potentiation, antagonism effect of pathologic conditions. With the use of drugs increasing, it is rather striking that relatively little has been done on the interactions of drugs especially in man.

Examples of synergism are easy to find. A patient has muscular pain which keeps him from sleeping. Aspirin is prescribed to relieve pain and with it a barbiturate is used to produce sleep. The drugs are synergistic because together they accomplish the therapeutic aim more effectively than any safe dosage of either drug separately. Mercurial diuretics preceded by an acidifying salt such as ammonium chloride will produce more effective diuresis than either medicament given alone. Clinical synergism is where different drugs producing different effects improve the clinical condition. In peptic ulcer this principle is well illustrated by administering an antacid, an antispasmodic and a central nervous system sedative. In such a situation the pharmacologic responses have little in common and it requires skill on the part of the prescriber in the judicious selection of the synergistic therapeutic agents.

Potentiation is when two simultaneously administered drugs elicit a response greater than the sum of their independent actions. There are not too many such examples. Meprobamate will prolong sleeping time induced by a barbiturate. It does not confer additional power to the barbiturate but synergizes and facilitates its action. A classical example is morphine and scopolamine. Each drug elicits a sedative action on the higher cerebral centers and the combination produces more sedation than the sum of the two.

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ly valuable in the treatment of poisoning. Caffein antagonizes Chloral Hydrate. Atropine blocks acetyl-choline. However, it is not always like the neutralization of an acid by a base. In a complex biological system it is not so simple, although partial antagonisms are not rare. Histamine test for gastric acid secretion can be augmented by mepyramine which blocks all its other effects except its desired action on acid secretion. Probenecid has the capacity to block tubular excretion of penicillin. Disulfiram inhibits oxidation of acetaldehyde when alcohol is metabolized.

But the interactions between drugs may be much more complex especially when each one has several important actions at different sites for example phenobarbital and alcohol which are not quite as additive as one is led to expect in pharmacology text books for phenobarbital potentiates the effect of alcohol and the individual effects are not additive. Similarly amphetamine and phenobarbital given separately produce contrasting effects, but together there is a change in mood described as elation, light hearted, happy. Thus we see that the combined effects of some drugs are really unpredictable and some can be very unpleasant.

Sommers[1] has described how an X-ray contrast agent for bronchography which appeared to be quite safe when used during barbiturate anesthesia caused a syndrome resembling decerebration in three children anesthetized with ether. This unhappy observation was then reproduced in animals also. Other examples of dangerous interactions are the coma which has followed the administration of pethidine to patients receiving an amine-oxidase inhibitor[2,3,4] and the serious hypertensive reactions in patients given methyl amphetamine while on tranylcypromine.[5,6] Serious hypotensive reactions in patients on reserpine who are being anesthetized for operation are becoming well recognized as is the hypotension in patients with adrenal cortical insufficiencies who are subjected to anesthesia.

Further clinical observations will of course be useful, but much work needs to be done on drug interactions in both animals and man. A study should involve using a number of doses of each drug and their combinations and observing the effects of varying the order in which the drugs are given and the interval between them. Such work by Loewe[7] has already considerably clarified the presently imprecise concepts of synergism and antagonism by studying drug combinations in animals.

In the meanwhile we should keep in mind the risk in giving drugs concurrently. Curiously enough this is very much in the minds of many of our patients who are already taking several drugs, and for whom we prescribe another in addition, for they often hesitate to take the pill thinking the new one may "interfere" with the others. Perhaps we should assume ourselves this type of sophistication and hesitate and think twice about the polypharmacy in which we are all habitually engaged. We should not share the enthusiasm for combined preparations still shown by many drug firms, since the pharmacological data is still too sparse in most such combinations.

L.H.N.

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Mediconatrophobia

The Syndrome

Limitation of salt intake is frequently desirable in hypertension, cardiac failure and renal shutdown. This valuable observation has led all too often to the dangerous illness "mediconatrophobia," an illness affecting physicians but creating dangers primarily to their patients.

The following case history is not unique; it illustrates the fatal outcome of this dangerous disorder.

A 78 year old woman was admitted to the hospital because of weakness, low-grade fever, diarrhea and vomiting. She had suffered from arteriosclerotic heart disease for several years. She was treated with multivitamins, sedation and *low sodium diet.* The first week she remained alert but was weak; the second week there was progressive nausea, vomiting and lethargy; the third week she started twitching and the fourth week she lapsed into coma and died. An electrolyte series the second week was CO_2 24 mEq/L, Cl 80, Na 127, K 4.4. Autopsy did not reveal any satisfactory anatomic cause of death and her demise was attributed to salt depletion.

Its Prevention

If salt loss can be replaced daily as it occurs, hyponatremia should never occur. Generally speaking, gastric or intestinal fluid loss should be replaced by an equivalent amount of isotonic salt solution. Patients with indwelling gastric or intestinal suction should not be permitted any oral fluids. Serum levels of sodium should not be permitted to fall below 135 mEq/L. Urine output of sodium should exceed 20 mEq per day. The average person needs about 70 mEq of Na Cl above loss by drainage tubes.

Its Treatment

It is almost impossible to raise a significantly low serum sodium with isotonic (normal) saline. Calculate as follows: Body weight in kilos (pounds divided by 2.2), times .6, times 135 minus the observed serum sodium, indicates the deficit in mEq. Replace this with either 3 per cent Na Cl (480 mEq/L) or 5 per cent Na Cl (800 mEq/L). Do not give any other fluid for several hours after the hypertonic saline.

Example: A 170 pound man has a serum sodium of 120. Convert pounds to kilos ($\frac{170}{2.2} = 77$ Kilos). 77 times .6 times (135-120 or 15) equals 690 mEq. This equals $\frac{690}{800}$ L or 840 ml of 5 per cent NaCl which should be given over several hours without any other fluids.

Effect Of Treatment

Serum sodium rises; the swollen overhydrated body cells shrink to normal size and recover normal function; a lethargic moribund patient suddenly starts to take an interest in life. The results are often dramatic and satisfying. Salt is one of our best miracle drugs!

R.N.B.

Furadantin, Oral And Intravenous

Nitrofurantoin USP (Furadantin—Eaton) was assessed by The Medical Letter in 1959 as a valuable broad-spectrum oral antibacterial agent for many infections of the urinary tract (Medical Letter, 1:37, 1959). A parenteral dosage form had been developed with polyethylene glycol as a solvent, but it was abandoned in 1958 because of severe and, in at least two cases, fatal metabolic acidosis produced by the solvent.

The present Furadantin Sodium for intravenous administration, in aqueous solution, can be used in patients who cannot take medication by mouth because of nausea and vomiting or gastrointestinal disorders interfering with absorption. When administered intravenously, Furadantin is largely and rapidly excreted in the urine, exhibits no antibacterial activity in the blood at the end of an infusion, and does not penetrate to tissue infections.

Oral Furadantin is well absorbed when given by mouth, and is also largely excreted in the urine, with inappreciable concentrations in the blood. Thus, neither the oral nor the parenteral form is of use for systemic infections, as previously claimed but now disclaimed. For infections of the urinary tract it is active against a wide range of organisms, including many which are resistant to other drugs; for example, E. coli and Klebsiella-Aerobacter as well as some strains of staphylococci. Most strains of Pseudomonas aeruginosa (B. pyocyaneus) and many strains of Proteus are resistant to it. Sensitive strains develop resistance to Furandantin only to a very limited degree *in vitro* or *in vivo*.

Chronic infections, however, may sometimes benefit from sterilization of the urine with a drug such as Furadantin, even if the organisms are not eradicated from the tissues. Failure of the drug to eradicate an organism known to be sensitive to it (as with any drug in urinary tract infection) suggests stasis due to obstruction, stone or neurogenic disturbance, which must be dealt with before this or any anti-infective agent can be effective.

SIDE EFFECTS—At least 25 cases of peripheral neuropathy, some severe and irreversible with disastrous outcome, have been reported with oral Furadantin. Obviously, polyneuritis is also a potential hazard of the intravenous form. The neuropathy is characterized by edema and demyelination of nerve fibers, and secondary changes in the spinal cord and striated muscles. If renal function is impaired, Furadantin should be used only with close clinical and laboratory (urea nitrogen, etc.) control.

Reprinted from the Medical Letter on Drugs and Therapeutics, New York, N.Y.

Intestinal Virus Linked To Common Cold

For the first time an intestinal virus has been found to cause the common cold.

The virus, Coxsackie A-21, one of a group of "hardy agents of small size" which commonly inhabit the intestinal tract of man, was recovered from the throats of cold sufferers among Marine personnel at Camp Lejeune, N. C. Group A Coxsackie viruses previously have been associated with mild fevers and neurological diseases.

The importance of Coxsackie A-21 in producing cold symptoms and the possible role of other intestinal viruses in this syndrome remain to be determined. If Coxsackie A-21 is found to contribute substantially to the incidence of colds, there are indications that a preventive Coxsackie A-21 vaccine would prove effective.

Investigators in this country and England have recovered other viruses having properties of intestinal viruses from persons with cold-like illnesses.

Chronic Ulcerative Colitis

Of all the agents employed in chronic ulcerative colitis—sedative, anti-spasmodic, anti-bacterial and hormonal—the last two appear to have the greatest influence on the symptoms and the clinical course of the severe forms of this disease. It is true that favorable clinical reports have appeared on many different drugs, but the reports seldom take into account the fact that ulcerative colitis is a chronic disease of unknown cause, characterized by unpredictable remissions and recurrences, and that milder attacks usually run a self-limited course regardless of therapy. In severe cases, however, therapy with corticosteroids or ACTH can often shorten the duration of attacks and decrease toxemia, fever and diarrhea. There is little evidence that recurrences are prevented on long-term steroid therapy.

Systemic Steroids and ACTH—One of the first controlled trials of steroids in chronic ulcerative colitis (S. C. Truelove and L. J. Witts, Brit. Med. J., 2: 1041, 1955) indicated the effectiveness of these agents. In this trial, over a six-week period the patients on cortisone showed a much higher rate of improvement than those on placebo. Other studies with ACTH and the newer corticosteroids—and the experience of clinics managing large numbers of such cases (J. A. Spencer, et al., Gastroenterology, 42: 113, 1962) —have confirmed these results. Of the newer (non-salt-retaining) corticosteroids, there is no evidence that any one is superior to the others. In systemic therapy with corticosteroids, the patient must be carefully observed for the usual psychological and somatic untoward effects.

Topical Steroids: In one small but well controlled study of outpatients with ulcerative colitis of the distal colon, a retention enema containing 20 mg. of prednisolone-21-phosphate was more effective than a placebo enema (S. G. F. Matts, Lancet, 1: 517, 1960). Other studies also suggest that topical steroids alone may occasionally be effective in the treatment of ulcerative colitis of the distal colon.

Psychotherapy — In one of the few well controlled trials of treatment programs (W. J. Grace, et al., Gastroenterology, 26: 462, 1954), the mortality rate, the need for surgery and the incidence of serious complications were considerably less in the group in which psychotherapy from the family physician was the mainstay of treatment than in the group managed mainly by conventional diet, antibacterial agents and other drugs, but without hormones. It is probable that the results in severely ill patients would have been better if corticosteroids or ACTH had been employed.

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THE PRESIDENT'S PAGE

The Intern And The Community Hospital

For many of the post-war years, there has been a marked imbalance in the availability of American graduates for hospital internships. The imbalance has been predominently in favor of the university-affiliated hospital and to the marked disadvantage of the community hospital. This situation has progressed to such an extreme that it has become a major problem in American Medicine.

One hears such boasts on the part of our highest ranking medical schools as that 30 per cent of their graduates go into research and other non-practising fields, and that 70 per cent enter the specialties. That these not entirely idle boasts contribute to the over-all shortage of interns is highly probable. Coincidentally, it is symbolic of a certain perversion of the reason for studying medicine in the first place.

Surely the primary purpose for the study of medicine is the care of the sick! I would suggest that this is the aim of the great majority of those who enter on the arduous and expensive study of Medicine. The diversion of as many as 30 per cent to such fields as research suggests an unusual situation. Either these medical schools attract a disproportionate number of students of exceptional talent who are not interested in personal patient care, or the medical schools are highly successful in channelling the interests of students away from private practice.

Be that as it may, this is a relatively minor cause of the shortage of American graduates in community hospitals. By far the greater reason for this disparity is the subtle indoctrination of the student in the importance of the university environment from the time he has completed his preclinical courses until he receives his diploma. So successful is this indoctrination that the university-affiliated hospitals invariably fill their highly expanded post-war quotas, while the community hospitals, with rare exceptions, are under constant threat of disapproval of their internships if they fail to obtain at least 25 per cent of American graduates.

So far as the American graduate is concerned, he finds himself in a preferred position. His lot has improved immeasurably in such important details as pay, housing, free time and fringe benefits. He is greatly sought after and can pick and choose. The fact that often times the case load per house officer in the affiliated institution is so diluted by the excess of houseofficers that he must devote much of his time to the more esoteric phases of internship, is compensated for by the prestige of the appointment. Meanwhile the community hospital, overflowing with teaching material so basic to the training of good doctors in patient care, must devote ever greater efforts to attracting American graduates, often with very limited success.

Why is the American Medical School graduate so reluctant to cut the umbilical cord which ties him to the university atmosphere? How long does he propose to remain in its warm and familiar safety? Is it fear of what comes next? Does he dread venturing elsewhere? The truth is that, in the great majority of instances, sooner or later he must sever his ties to the source of his medical training and "meet the people." And when he does, in more instances than not, he will find himself at long last in a community hospital. Then, for the first time, he will become aware of what should have been apparent to him from the start—that community hospitals are where most of the sick are; that community hospitals are staffed by great numbers of his predecessors, who are just as highly talented medical people as he thought existed only in university hospitals.

I offer this comment chiefly for the consideration of the medical student and the young house officer. In the long run, he is likely to be a doctor who will practice in a community hospital, perhaps as a member of its staff in charge of recruiting American graduates for its internships, and for a much longer time than he will be an intern or a house officer himself. Let no one belittle the value of the community hospital in planning for a life's work in medicine, either as a physician-in-training or as a physician in practice.

Morris P. Pitock, M.D.

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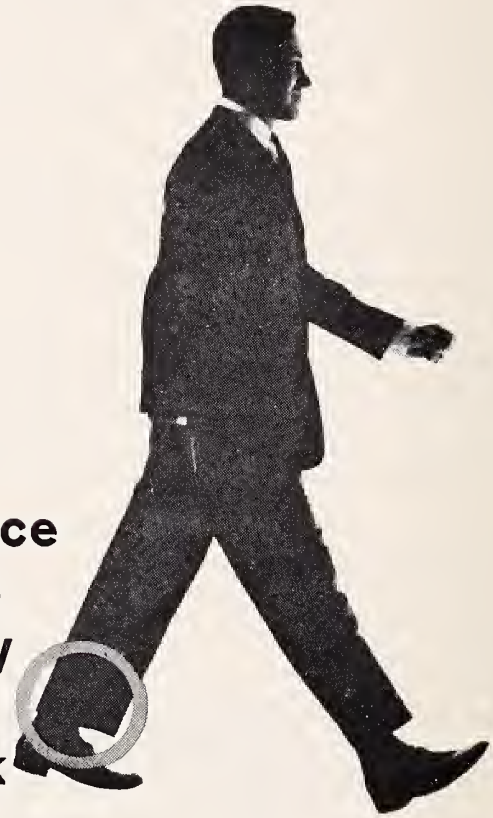

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*U. S. PATENT NO. 3,004,893

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Clinical Problems In Passenger Flying

Introduction

Frank D. Gray, Jr., m.d.
Guest Editor

Joining the problems of the flyer's sub-atmospheric pressure environment and those of the supra-atmospheric pressure environment of the diver is logical for they not only represent the extremes of an environmental gamut but also because similar diseases require caution for the participants of both, and both have increased in prominence at a parallel rate. This morning we learned something about diving hazards. They include thoracic squeeze in skin diving, and decompression sickness, air embolism and interstitial emphysema in SCUBA diving. We also heard about preventive measures for these dangers.[1]

The program this afternoon is concerned with the clinical problems of passenger flying, particularly as they affect patients who have diseases of the respiratory and circulatory systems. When we consider flying we worry about these diseases because they are commonly associated with an increased requirement for oxygen or susceptibility to its lack, and we know that at high altitudes the pressure of oxygen is lower than at sea level unless it is artificially raised by the administration of supplementary oxygen.

We know that people with coronary artery disease or congestive heart failure suffer from hypoxia of the heart muscle. Patients with some types of chronic lung disease, such as pulmonary emphysema, are often hypoxic. The oxygen can be replaced to some extent by having the individual breathe it through a mask, but then we come up against another problem because some of our patients with emphysema, owing to an accumulation of carbon dioxide, do poorly if they are given high concentrations of oxygen to breathe. The question arises whether or not the oxygen administered to our patients in an aircraft may be hazardous because of this.

We do accept air travel. It is an economic necessity to many businessmen who might also have a cardiopulmonary disease, and it's the only way, other than private passenger car travel, to reach some parts of the world and some parts of our own country today. Furthermore, any hazard associated with passenger flying has to be weighed against the time factor, because the fatigue of long surface travel might be much worse for a patient than a shorter period of relative hypoxia. Nor can we be sure that, just because we tell patients to take surface transportation, they are not going to suffer hypoxia. I had a very clear illustration of this recently when a patient from this area returned from a trip to the West coast. When he reached home he was fatigued and had cardiac decompensation, and his physician asked me to see if there were anything further to be done for him. The patient reported that he had taken the trip by automobile after his physician told him that he should not fly because the lack of oxygen would be bad for his heart. The physician apparently had not realized that for much of the trip the patient would be at a higher altitude in his automobile than the equivalent cabin altitude in an ordinary commercial aircraft and this for many hours under very trying circumstances. I am certain that, in this particular instance, the patient would have been better off going by plane than driving out in his own car.

We must remember that we are being negligent in our duty if we take the easy way out and simply tell all patients that they mustn't fly, because, in many ways, this may lead to more harm than good. I am sure that our speakers this afternoon will provide the guidlines that will allow us to plan for our patients intelligently.

Dr. Earl T. Carter earned his M.D. and M.S. degrees at Northwestern University, and his Ph.D.

Part Two of the M. Grant Blakeslee Memorial Program presented on Friday, September 21, 1962 by the New Haven Heart Association in cooperation with the Connecticut Heart Association and Yale University School of Medicine, New Haven, Connecticut.

degree at University of Texas Medical Branch, Galveston. He served as Flight Surgeon and Research Physiologist in the U. S. Air Force. Presently Consultant in Medicine at the Mayo Clinic and Assistant Professor of Medicine, Mayo Foundation, he has been on the faculty of Ohio State University Medical School and has been an Aviation Medicine Consultant for North American Aviations, Inc., and AVOC Corporations. He is a member of the Research and Advisory Council to the Air Surgeon, Federal Aviation Agency.

Dr. Otis B. Schreuder received his M.D. degree from the University of Oregon and has been associated with flying and the military for most of his adult life, having joined the Washington National Guard in 1911, served as a pilot in World War I and in the U. S. Army and Air Force until 1953, going from 1st Lieutenant to Brigadier General. He has served on many organizations and committees in matters relating to flying and is a past president of the Airlines Medical Directors Association. At present he is Medical Director of Pan American Airways, Inc., Overseas Division.

Dr. Ludwig G. Lederer received M.S., M.D., and Ph.D. degrees from Northwestern University. He is Medical Director, American Airlines. He has served as medical director or consultant to other airlines and aviation facilities, and was Assistant Clinical Professor of Medicine, George Washington University Medical School. He is a past president of the Airlines Medical Directors Association.

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The Renaissance represented a crisis. It was a rebirth. And to be *re*born is more important than to be born, for rebirth comes about with full awareness of the fact that one is going to live again. Resurrection has always moved men more deeply than birth itself.

Between the uncertainties of the Middle Ages and the all-embracing intellectualism of the seventeenth century, the Renaissance emerged in deep crisis. As man realized that his world was disintegrating, he fell victim to an uneasiness that lasted from 1400 to 1600. At the dawn of the seventeenth century, he finally found his place in a new world. Galileo and Descartes were his patron saints in the tremendous spiritual exodus.

Man, then, began to live between the sword and the wall. Behind him he left a formulistic Christianity; before him rose a world that looked unalterable. The horizon was closed off on the side of the future. His only alternative was to return to the past philosophically and to enjoy the present physically. Since a disintegrating tradition failed him and he foresaw only a confused, dark future, man had to turn inward, upon himself, upon his body, and to nature as his last resources.

Many different factors were involved in this formidable growth of individualism and relaxation of authority; rationalism, freedom of thought and opinion, the circumnavigation of the globe by Spaniards and Portuguese and later by the English and Dutch, the discovery of the printing press which aided in the diffusion of culture (among the incunabula were works on popular medicine as well as the Bible), the discovery of gunpowder which destroyed feudalism, and the discovery of heliocentric astronomy by a Polish physician called Copernicus.

—*Marti-Ibañez*

Clinico-Physiologic Aspects Of Passenger Flight

EARL T. CARTER, M.D., PH.D.
Rochester, Minnesota

The use of the commercial airliner and the private aircraft has increased steadily and rapidly, and as a result physicians are often consulted as to the advisability of flight for a given patient. To advise a patient properly requires a knowledge of the physiologic effects on the patient of a given disease. It is also necessary to know the physiologic responses to the various environmental alterations anticipated during flight. The purpose of this presentation is to review some of the established responses to altitude.

Effects Of Changes In Ambient Pressure

The alteration of paramount importance associated with ascent to higher altitudes is a decrease in barometric pressure. Figure I depicts the relationship between altitude and barometric pressure. The temperature pattern is included to point out the fact that one cannot confine a study of the effects of altitude to one factor alone. However, it is the curvilinear decrease in ambient pressure that induces the most important changes in both healthy persons and patients.

Even though all modern commercial aircraft have pressurized cabins, exposure to a low surrounding pressure has not been completely eliminated. When a jet airliner cruises at 38,000 feet (barometric pressure of 3 pounds per square inch) the internal cabin pressure is permitted to decrease to the level found at about 8500 feet, namely 10.7 pounds per square inch or 554 mm. Hg. Passengers thus find themselves at a physiologic altitude of about 8500 feet when comfortably seated in a transcontinental jet airliner. This represents a decrease in barometric pressure of more than 30 per cent if, for example, these passengers were residents of the New England coast. It will be shown that exposure to a 30 per cent decrease in ambient pressure can be of clinical significance.

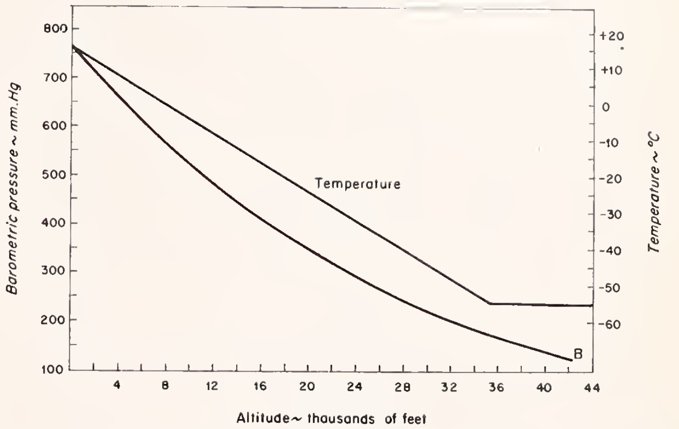

FIGURE I
Change in ambient pressure and temperature with change in altitude.

Partial Pressure of Oxygen—A decreasing barometric pressure associated with ascent to high altitude has several major biophysical effects. The partial pressure of oxygen in the inspired air passing through the trachea is a function of the concentration of inspired oxygen and the pressure at which this oxygen is breathed: Tracheal partial pressure of oxygen (P_{O_2}) = (F_{O_2} [B-47]) mm. Hg, in which F_{O_2} is the fractional concentration of inspired oxygen and B is the breathing pressure. The correction factor, 47, is the vapor pressure of

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Presented as part of a Symposium on Clinical Problems in SCUBA and Skin Diving and Passenger Flying sponsored by the New Haven Heart Association, Inc., and Yale University, New Haven, Connecticut, September 21, 1962.

EARL T. CARTER, M.D., Ph.D. Consultant, Section of Medicine, Mayo Clinic; Assistant Professor of Medicine, Mayo Foundation, Graduate School, University of Minnesota; Rochester, Minnesota.

water in the trachea and lungs. Since the F_{O_2} for atmospheric air is essentially constant (.209) until very great altitudes are reached, the tracheal P_{O_2} will be controlled only by the value of the ambient pressure, B, when atmospheric air is breathed. Thus, at 8500 feet the tracheal P_{O_2} would be calculated as follows: Tracheal $P_{O_2} = .21\ (554\text{-}47) = 106$ mm. Hg. The normal sea-level value would be $.21\ (760\text{-}47) = 150$ mm. Hg. Changes in tracheal P_{O_2} will naturally be reflected in the P_{O_2} for the alveolar air and, hence, ultimately the oxygen saturation of the arterial blood. The sea-level tracheal P_{O_2} of 150 mm. Hg is normally associated with an alveolar P_{O_2} of about 100 mm. Hg, while at 8500 feet, at which the tracheal P_{O_2} is 106 mm. Hg, the alveolar P_{O_2} is about 70 mm. Hg. Hence, at an altitude of 8500 feet, an easily measurable decrease in oxygen saturation of arterial blood occurs. Figure II relates arterial oxygen saturation to altitude and shows that the value for a person seated in a pressurized jet airliner would be about 90 per cent as compared with the sea-level value of 98 per cent. The process of desaturation of arterial blood associated with exposure to altitude will be applied to practical clinical problems later in the paper.

Expansion of Gases—Another clinically significant physical effect of flight is the expansion of the water vapor-saturated gases that may be contained in various body cavities. Such gas pockets are normally found in the middle ear, sinuses, and the intestinal tract. A given volume of gas will tend to expand during ascent to higher altitude according to the following function:

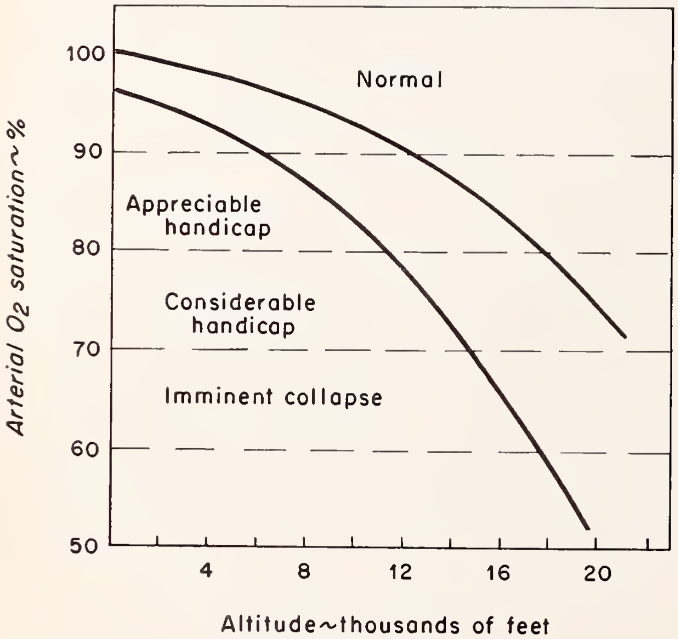

FIGURE II
Effect of altitude on arterial blood oxygen saturation.

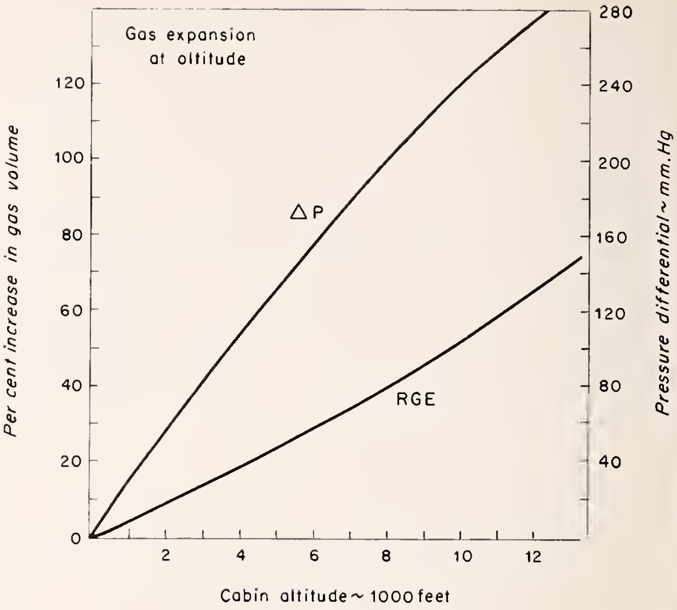

FIGURE III
Relative gas expansion (lower curve) and transmural gas pressure in a rigid container (upper curve) during ascent to higher altitude.

$$\text{RGE} = \frac{B_1 - 47}{B_2 - 47}$$

in which RGE is the relative gas expansion and B_1 and B_2 are the initial and final barometric pressures, respectively. The correction factor, 47, is again the value of the tension of water vapor at normal body temperature, expressed in mm. Hg. Again using the example of flight in a commercial jet at a "cabin altitude" of 8500 feet, one can calculate the relative expansion of a pocket of gas maintained at body temperature as follows:

$$\text{RGE} = \frac{760 - 47}{554 - 47} = 1.41.$$

This means that a given volume of gas would tend to increase its volume by 41 per cent if carried from sea level to 8500 feet. However, volumes of gas contained in the various body cavities are not usually permitted to expand freely, because of a certain degree of trapping. The air contained in the middle ear can almost invariably expand by way of the eustachian tube, but intestinal gas and that in the paranasal sinuses is not always released as it expands. If a gas pocket is not permitted to expand and escape, a pressure differential must develop across the containing walls. If gas is trapped in an elastic container such as an intestinal viscus, the build-up of pressure is partially mitigated by expansion of the viscus; however, gas trapped in a rigid container such as a maxillary sinus is not permitted any expansion during ascent.

In the latter case, then, a rather large pressure differential may exist across the walls of a paranasal sinus, leading to severe pain and hemorrhage. In Figure III the lower curve is the RGE as related to altitude and depicts the degree of expansion an unimpeded volume of saturated gas would manifest as the ambient pressure decreases. The upper line illustrates the transmural pressure differential in a rigid cavity such as a nasal sinus or dental apical abscess, in which there is no opportunity for escape or expansion of the contained gas. It is seen that at a modest altitude of 8000 feet the pressure inside a sinus could be as much as 200 mm. Hg higher than that outside. However, gas volumes contained at various points within the body usually will not follow the two functions shown but rather will fall considerably below the lines. A combination of flatulence, belching, and abdominal distension usually precludes excessive intra-abdominal pressure, and rarely is a sinus totally blocked.

Of equal importance to the physician is the effect of ascent on pathologic gas-containing cavities such as abscesses, obstructed loops of bowel, intrapleural collections, or even colostomy bags. The above-mentioned principles of gas expansion apply to these abnormal gas-containing pockets.

Decrease in Density of Air—In addition to the expansion factor, one must consider the decrease in density (mass per unit volume) of the surrounding air. The density of the air will diminish in almost direct proportion to the decrease in barometric pressure as altitude increases. Thus at 8500 feet the density of the air will be about 73 per cent of that found at sea level. A decrease in density has several interesting effects on the mechanics of breathing. There will be a decline in maximal expiratory pressure because one has to carry out a relatively greater degree of compression of the less dense air in the lungs in order to achieve a given intrapulmonic pressure. Also, the efficiency of the cough mechanism is somewhat impaired because less kinetic energy can be brought to bear on mucus or other foreign material in the airway. On the other hand, in the presence of bronchial obstructive disease in which there is *turbulent* flow through pathologically narrowed or tortuous airways, breathing will be easier in less dense air, since the energy required to maintain turbulent airflow is proportional to the density. This is the principle behind the use of helium-oxygen mixtures during acute asthmatic episodes. Thus, the patient with emphysema or asthmatic bronchitis may actually experience easier breathing at higher altitudes. However, the all-important factor of diminished tension of atmospheric oxygen may negate any such beneficial effects. One might thus predict that the breathing of oxygen-enriched mixtures at high altitude would have the same therapeutic effects as would an oxygen-helium mixture used on the hospital ward.

Temperature—As was shown in Figure I, there is a steady decline in ambient temperature as altitude increases. Once the stratosphere is reached (about 35,000 feet at 40 degrees N. latitude) the outside temperature remains constant until the ozone layer is reached (60,000 feet or more). Ordinarily, cabin temperature is maintained at ground-level values in all commercial aircraft. The usual point of temperature stress is prior to takeoff, when the aircraft is sitting on the ground in the hot sun. This is usually temporary, but it is interesting to note that the peripheral dilatation which results from high environmental temperature is antithetical to the circulatory response to hypoxia, which is peripheral vasoconstriction.

Clinical Significance Of Changes In Ambient Pressure

The physical alterations of major clinical significance during commercial aircraft flight can thus be considered to be (1) the decrease in tension of atmospheric oxygen and (2) the expansion of the gases. These environmental aberrations have been shown to have certain specific clinico-physiologic effects which can now be considered.

Oxygen Saturation of Blood—As was shown in Figure II, there is a measurable decrease in the oxygen saturation of the blood of a person flying in a pressurized jet aircraft. If a normal value of 90 per cent saturation is assumed, one can make several interesting computations. At 90 per cent saturation, with a hemoglobin value of 15 gm. per 100 ml. of blood, the oxygen content of the arterial blood will be 18 volumes per cent (.90 x 15 x 1.34), in which 1.34 is the volume of oxygen bound by each gram of hemoglobin. Assuming a normal arterial-to-venous (A-V) oxygen difference of 5 volumes per cent, the mixed venous blood would contain 13 volumes per cent of oxygen, or have a venous oxygen saturation of 65 per cent, and the oxygen tension would be approximately 35 mm. Hg. This state of affairs is not greatly different from the normal and does not normally result in significant physiologic impairment (the normal P_{O_2} of arterial blood is about 95 mm. Hg, venous about 40 mm. Hg). However, the same calculations applied to a person with 10 gm. of hemoglobin per 100 ml. of blood are very revealing. Again assuming 90 per cent saturation, the oxygen content of the arterial blood at 8500 feet altitude would be 12 volumes per cent (.90 x 10 x 1.34). If 5 volumes per cent were extracted for the normal metabolic needs as the blood passes through the tissues, the venous blood would contain 7 volumes per cent of oxygen, representing a saturation of about 53 per cent and tension of about 20 mm. Mg. Such a low venous oxygen tension, which

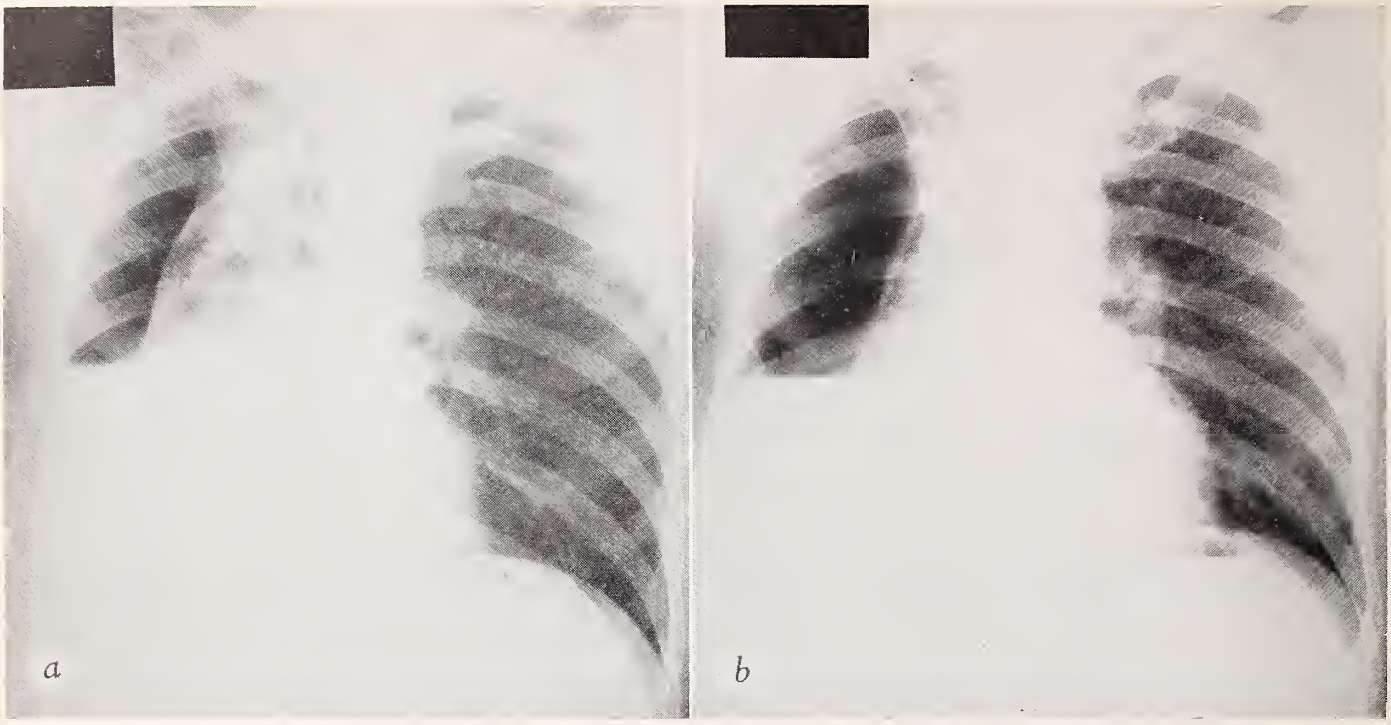

FIGURE IV
Increase in size of prior pneumothorax (*a*) following ascent to 8500 feet (*b*).

implies a low oxygen tension in the tissue is incompatible with normal cell metabolism. Corrections for this require a decrease in the A-V oxygen differences. A decrease in the A-V difference to support the venous and tissue oxygen pressures would be accomplished by an increase in the cardiac output according to the Fick principle:

$$\text{Cardiac output} = \frac{\text{Metabolic rate}}{\text{A-V difference}}.$$

These computations show that any clinical conditions associated with anemia would necessitate an adjustment in cardiac output.

In the example cited above, the principal defect was a lack of hemoglobin. Similar analysis of a pathologic state in which the defect was not lack of hemoglobin but low oxygen saturation of the arterial blood would show that, again, physiologic compensation to high altitude would occur as an increase in cardiac output. For example, a patient with pulmonary emphysema may have a resting arterial saturation of 90 per cent while at ground level. This is physiologically equivalent to flight at an altitude of 8500 feet for a normal person. Now, if such a patient should ascend to 8500 feet cabin altitude, he will actually be at a higher altitude physiologically speaking, perhaps equivalent to 12,000 feet or more. He would thus have to maintain a higher cardiac output in order to avoid excessive tissue hypoxia. The clinical significance of a cardiac output several times normal would, of course, depend upon the clinical status of the cardiovascular-pulmonary system. Such judgment will rest upon the physician.

Expansion of Gas—The effects of gas expansion are normally not significant. An otolaryngologic disorder is the usual basis for a problem in this area. Blocked paranasal sinuses can be excruciatingly painful, both on ascent and on descent, if the air normally contained in a sinus cannot exchange freely with the outside air.

Otitis media and eustachitis usually result in difficulty on descent to higher barometric pressures because air can leave the middle ear more easily than it can re-enter, owing to the one-way valve effect of the torus in its position over the orifice of the eustachian tube in the nasopharynx.

Abdominal gas distention is usually limited because of passage of flatus during ascent. However, in patients with an unusual amount of bowel gas, painful abdominal distention can result at higher altitudes. Of more clinical importance would be a pocket of gas contained in a pathologic cavity such as a pneumothorax. In such a case an expansion of 40 per cent may not be permissible on a clinical basis. Figure IV shows roentgenograms of a pneumothorax before and after ascent to approximately 8500 feet. Similar considerations would have to be given to a gas-containing abscess, an isolated loop of bowel, or subcutaneous emphysema occurring, for example, secondary to injury to the thoracic wall (Fig. V), in which the condition would obviously be aggravated should further expansion of the subcutaneous gas be permitted.

Acute Hypoxia—Before concluding, let us explore one additional environmental stress. The discussion thus far has been confined to flight in a pressurized aircraft in which passengers will be exposed to a "physiologic altitude" of no more than 8500 feet. However unlikely, should accidental loss of cabin pressure occur in a modern jet airliner flying at 40,000 feet, an abrupt exposure to low barometric pressure would occur (140 mm. Hg at 40,000 feet), resulting in severe acute hypoxia.

Figure VI illustrates the course of the oxygen saturation of arterial blood should a window fail in a pressurized Boeing 707-type airliner during flight at 40,000 feet. The pilot would begin an emergency descent as rapidly as possible. In spite of the relatively high performance capability of the modern jet airliner, however, it is not possible to descend to lower altitudes quickly enough to avoid the severe hypoxia demonstrated in Figure VI. The course shown for the oxygen saturation of the arterial blood will induce temporary unconsciousness in a healthy person. What is not known is the effect of a similar stress on a group of elderly persons or patients suffering from cardiovascular or pulmonary disease. Commercial jet airliners have emergency oxygen systems to protect the passengers in such an eventuality. This protection is in the form of a continuous-flow type of oxygen mask that is designed to be placed over the oronasal region in the event of an emergency. Studies in healthy adults have shown that such a mask will prevent severe hypoxia if it is applied no later than 15 to 30 seconds after cabin decompression begins. What little data we have suggest that patients with significant disorders involving respiratory functions can be similarly protected, provided there is no delay in applying an oxygen mask once hypoxia begins. The extensive experience of the U. S. Air Force with the air evacuation of sick and wounded persons has clearly shown that, with the proper use of oxygen and therapeutic drugs, the vast majority of patients can be carried safely by air.

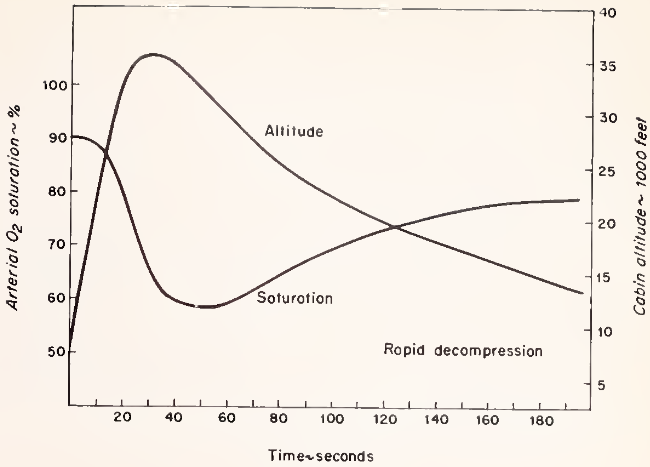

Figure VI

Time course of cabin pressure and arterial blood oxygen saturation following rapid decompression at high altitude.

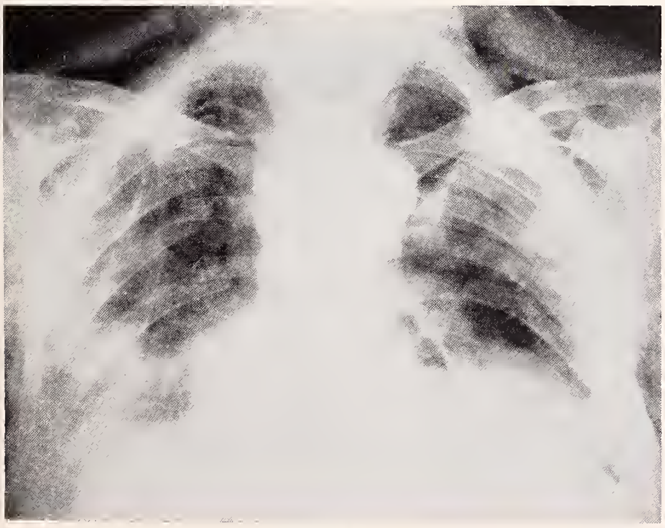

Figure V

Severe posttraumatic subcutaneous emphysema.

Decompression Sickness—A statement about decompression sickness related to the release of dissolved nitrogen from the body fluids should be made. Even in the event of loss of pressurization during flight at 40,000 feet, decompression sickness, or the "bends," would not likely occur, because exposure to low barometric pressure would be brief. Should the aircraft remain at an altitude of more than 30,000 feet without cabin pressurization, then even with adequate administration of oxygen, decompression sickness would become a significant problem. In a population of healthy young adults exposed to a barometric pressure of 140 mm. Hg (40,000 feet), one would expect numerous cases of the "bends" after 15 to 20 minutes. Such prolonged exposure would be highly unlikely in commercial aviation.

Summary

It has been shown that the effects on the human body of ascent to higher altitude can be defined in a predictable fashion. The curvilinear decrease in barometric pressure during ascent is the fundamental change leading to the clinico-physiologic effects of chief importance to the practitioner. Gas expansion and oxygen desaturation of the blood, two responses that are of particular clinical significance, have been discussed. While the normal person can easily tolerate aberrations of the degree encountered in commercial aviation, persons with certain abnormalities pose a unique problem. Knowledge is needed of the physiologic responses to the environmental changes involved in flight before clinical judgment can be made in regard to the safety of flight for a given patient.

General Medical Problems In Passenger Flying

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Early in the air transport industry there was hesitation on the part of airlines in accepting the incapacitated passenger, however, at the present time the air transportation of this type of passenger in regularly scheduled flights is a common occurrence. The history of air evacuation of patients is well known and has been covered very well by many authors including Armstrong[1,2] and McFarland.[3] The first recorded evacuation by air was in 1870 during the siege of Paris when a number of patients were transported from the city by balloons. Although the airplane was developed and flown in 1903 by the Wright Brothers, it was only twelve years later that the seriously ill and wounded were evacuated by air from Serbia to Albania in the retreat of the French Expeditionary Forces. In the United States the aero-medical evacuation of patients dates back to the Air Service of the U. S. Army in 1918, with a gradual and progressive development, first by the Army Air Corps and later by the Air Transport Command, and now by the Military Air Transport Service of the United States Air Force. From the beginning of World War II until February 1954 the Air Force had evacuated 2,000,000 patients.

In view of the humanitarian aspect there has also been a gradual development of air transportation of the incapacitated person by commercial airlines, the humanitarian aspect being particularly important in international airline operation. It is now quite commonplace to transport a patient passenger long distances for special medical care, for example from Bangkok or Buenos Aires to New York.

Because of the numerous patients transported by civil air carriers in 1959 the President of the Aerospace Medical Association appointed a committee to prepare a brochure on "Medical Criteria for Passenger Flying"[4] for the physician to be used as a guide in the selection and approval of a patient for air travel. This publication gives in considerable detail the criteria used in deciding whether or not a patient should be allowed to fly and it is recommended to be used by all physicians who are interested in this subject. An editorial[5] on this publication is quoted in part: "Every physician nowadays, whatever his practice, may have to advise a patient whether or not to travel as a passenger on a regularly scheduled commercial flight. A statement (Medical Criteria for Passenger Flying) to guide the physician in formulating correct advice on this question has been developed by a committee of the Aerospace Medical Association and approved by the American Medical Association for promulgation. This statement points out that flying is actually indicated as the mode of travel for many patients whom a physician inadequately informed on this subject might advise not to fly. Physicians called upon to advise their patients on flying will find this statement of great interest and help."

In the decision as to whether or not a patient should fly it is of value as well as interesting to know something of the operational characteristics of the present day aircraft. In Table I[4] is shown the Ambient Altitude of the Aircraft versus the Actual Altitude. In this table the Convair 880 has been substituted for the Convair 220 to bring it up to present day use. It will be particularly noted that

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Table I

Ambient (Actual) Altitudes versus Cabin Altitudes in Six Aircraft Commonly Used by American Carriers

	Cabin Altitude in Feet					
AMBIENT ALTITUDE, FEET	BOEING 707	DOUGLAS DC-8	LOCKHEED ELECTRA	VICKERS VISCOUNT	DOUGLAS DC-7	CONVAIR 880
40,000	7500	7000				8000
35,000	5500	5000				6000
30,000	3700	3200	8000			4000
25,000	1400	1000	5400	7900	8000	2000
22,500	Sea level	Sea level	4100	6510	6500	1000
20,000			2650	4930	5000	Sea level
15,000			Sea level	1750	1800	
10,000				Sea level	Sea level	

the pressurization in the turbo-jet aircraft (Boeing 707, Douglas DC-8, and Convair 880) is far superior to that of the piston-engined aircraft (DC-7). A relatively low cabin altitude is important to the comfort of all passengers and particularly so to the patient being transported by air.

In Table II[4] are shown many of the operational characteristics of the present day aircraft, the Convair 880 again being substituted for the Convair 220. It will be noted that the turbo-jet aircraft flies at a much greater speed than the piston-engined aircraft, speed being very desirable in the transportation of patients. Also, patients travel much more comfortably in the turbo-jet aircraft in view of the absence of any appreciable amount of vibration and the decreased noise level.

Frequently in the transportation of patients by air, oxygen is required. In this connection, "First Aid or Therapeutic" oxygen is available on turbo-jet aircraft. For example, on the Boeing 707 there are seven portable or "walk-around" bottles of oxygen located in strategic places in the airplane. There are also oxygen outlets with masks available at each passenger seat in the event of loss of pressurization. This oxygen system is a constant flow type and is separate from the operational crew oxygen system which is of the diluter demand type.

Of interest also is the fact that the Civil Air Regulations require certain emergency equipment to be aboard civil aircraft, such as survival and first aid equipment. Another requirement is that the seat belts must be able to withstand certain stresses.

There is one important fact to be kept in mind in the acceptance of an invalid for air travel. This is that regularly scheduled flights are for the traveling public and their comfort is essential. Therefore, the patient whose appearance, odor or behavior is objectionable to other passengers would, as a general rule, not be acceptable. Stated in another way, if a patient acts, appears or smells normal he would usually be accepted. It is also important to know that except in the case of emergency occurring in flight, flight service attend-

Table II

Operational Factors Concerning Six Aircraft

Factor	*Aircraft*					
	BOEING 707	DOUGLAS DC-8	LOCKHEED ELECTRA	VICKERS VISCOUNT	DOUGLAS DC-7	CONVAIR 880
Speed, cruising (miles per hour)	555	555	405	335	315	586
Speed, take-off (miles per hour)*	190	190	150	130	149	180
Speed, landing (miles per hour)†	155	155	125	136	139	150
Climb, rate (feet per minute), average	1,000	1,000	1,800	900	500	1,800
Climb, rate (feet per minute), maximal	4,000	4,000	2,200	1,350	2,000	2,800
Descent, rate (feet per minute) average	1,600	1,500	1,500	1,800	1,000	1,500
Descent, rate (feet per minute) maximal	15,000	15,000	5,000	3,000	6,500	15,000
Range, statute miles	6,100	5,500	3,500	1,400	5,200	3,200
Runway, length needed (feet)**						
Maximal: take off	10,500	9,500	4,750	5,440	6,350	6,500
Maximal: landing	6,800	6,700	4,750	4,870	5,100	5,720
Cabin differential pressure, maximal (pounds per square inch)	8.6	8.77	6.5	6.5	5.45	8.3
Capacity, maximal, passengers	189	189	104	50	99	110
Operating altitude, normal (feet)	25,000 to 40,000	25,000 to 40,000	18,000 to 25,000	16,000 to 25,000	15,000 to 25,000	25,000 to 40,000
Berths available	None	None	None	None	Yes	None
Litter patients, accommodations for	‡	‡	‡	None	‡	‡

* With maximal take-off gross weight.

† With maximal landing gross weight.

‡ Availability varies among the various airlines.

** At sea level and standard temperature 0° C. and standard pressure of 29.92 in. of mercury or 760 mm. of mercury.

ants cannot be expected to care for incapacitated persons to the detriment of service to the other passengers.

The larger air carriers in the indoctrination and training period of the flight service (cabin) attendants include training in first aid and procedures in the use of the emergency equipment. In some instances this training is patterned after the Red Cross First Aid Course with the necessary changes to make it applicable to airline operation. This training course includes the care of a normal delivery.

As previously stated, in most instances air travel is an excellent means of transporting a patient if he can be transported by any mode of travel. Therefore, it is believed that a few remarks on some medical conditions of the various systems might best illustrate the acceptability or rejection by the airline for air transportation.

EENT Conditions

An example of an eye condition which might be unacceptable for flight would be an acute severe glaucoma. This is due to the fact that the intraocular tension would be increased with increase in altitude as the result of reduction in barometric pressure. Another example would be penetrating eye injuries since trapped intraocular air expansion can cause extrusion of the lens or vitreous.[6] Nevertheless, even these cases can frequently be transported if the cabin altitude is kept at a sufficiently low level. This is often possible from an operational standpoint. In the turbo-jet it will be recalled that the cabin altitude is approximately sea level when the ambient (actual) altitude is 22,500 feet or below. It also should be remembered that the retina has a very high demand for oxygen and therefore in the air transportation of ophthalmological conditions, this should be taken into consideration and oxygen should be available for use if the cabin altitude exceeds 4,000 or 5,000 feet. Blind persons with a seeing eye dog are accepted by most airlines.

Persons having an acute respiratory infection or an allergic rhinitis may encounter difficulty in ventilating the middle ear and the sinuses due to congestion of the tissues of the nose and throat. This may result in an aerotitis or aerosinusitis. At the present time because of the excellent pressurization in the turbo-jet this is rarely encountered. As a preventive measure vasoconstricting agents should be used prior to and during flight. Some passengers with no pathological condition have difficulty with their ears due to the changes in barometric pressure with variation in altitude. This occurs mainly on descending and can in the majority of cases be prevented by such actions as yawning, swallowing or by the valsalva maneuver. Severe cases of otitis media with blockage of the eustachian tube are ordinarily not accepted.

Of particular importance is the air transportation of patients with fractured jaws. Although airsickness is relatively infrequent in commercial air travel, this must be kept in mind and therefore, patients with this condition should have a quick release mechanism of jaw fixation.

Recently the difficulties encountered in giving first aid to the laryngectomee has been brought to the attention of the American air carriers by the Medical Committee of the Air Transport Association. As a result, first aid treatment for the laryngectomized person is now being covered in the first aid course by the major airlines.

Metabolic And Endocrine Disorders

In general, it can be stated that if the patient with a disease which comes under this classification can travel he can be transported by air. Of interest is the diabetic. Diabetes also is not a contraindication to flight, however, the diabetic requiring insulin, if taken by injection, should have his insulin and syringe available in the cabin in case of necessity. Also, if he is subject to hypoglycemia he should have a candy bar or sugar cubes available. The majority of airlines do not allow their cabin attendants to give medication by injections, therefore the diabetic should be able to give this medication to himself if required during flight. Additionally, the larger airlines will onload a diabetic meal if arrangements are made prior to the flight. Rapid changes in time may be a factor on long flights, therefore, it is advisable for the diabetic to take this factor into consideration.

Hematological Conditions

It has generally been conceded that an individual with severe anemia should not fly. This is in view of the lowered oxygen carrying capacity of the blood due to the decrease in the number of red blood cells with its decrease in the amount of hemoglobin. The degree of anemia usually allowable has been stated as 50 per cent hemoglobin or 7.7 grams per 100 ml. Patients with a moderate anemia can be transported providing there are no other serious complications present. Oxygen may be required in flight if the simulated cabin altitude exceeds 4,000 to 5,000 feet.

There have been cases of splenic infarction due to the sickling trait which is present in approximately 5 per cent of the Negro race. This has occurred in altitudes as low as 5,000 feet, but as a rule, only occurs when the simulated cabin altitude is 8,000 feet or above with the duration of flight several hours or more.

Acceptance of cases of leukemia should be individualized. The mild case is acceptable whereas the more severe case is occasionally not acceptable in view of the severe anemia.

Disorders Of The Digestive Tract

Normally there is some gas present in the gastrointestinal tract, this gas expanding 50 per cent at an altitude of 10,000 feet. In the unpressurized aircraft this is of extreme importance. Those cases which ordinarily are not accepted are cases of intestinal obstruction and bleeding peptic ulcers and also those peptic ulcers which are in danger of perforating. Colostomy cases can be accepted if special precautions are taken, such as thorough evacuation through enemas and placing on a low residue diet prior to the flight. It is inadvisable to accept extremely large unsupported hernias because of the danger of strangulation.

Neuropsychiatric Disorders

Psychotic cases will be carried by some airlines with some limiting provisos. The hazard to the other passengers and crew must be taken into consideration, as well as any bizarre behavior which the patient may exhibit. Except under extraordinary circumstances those which require heavy sedation or restraint are not acceptable. In all instances psychotic patients must have a qualified person or persons in attendance. Epileptics are accepted if their attacks are controlled by medication. Many types of neurological cases are acceptable, some only after careful study and evaluation. Examples are recent fractures of the skull, severe concussion, injuries to the spinal cord and cases having had a cerebral hemorrhage.

The transportation of the recovered bulbar type of poliomyelitis is not the serious problem that it has been in previous years. However, if this type of passenger is transported by air preparation must be made by the airline concerned to have the proper power supply for the activation of the portable respirator in the event this apparatus is required.

Convalescent surgical cases present no trouble.

Communicable Disease

Patients having an acute contagious or communicable disease are not acceptable. This includes active cases of tuberculosis. This is because of the danger of transmission to other passengers or crew.

Pregnancy

It is generally conceded that pregnant women travel by air very well. There is adequate proof that flying has no deleterious effect either upon the normal pregnant woman or the fetus. According to the agreement of the International Air Transport Association Medical Committee, "expectant mothers may be accepted for carriage up to and including the 35th week of pregnancy, i.e., up to a date five weeks before their expected date of confinement." Some carriers will accept pregnant women up to within two weeks of confinement for short trips, providing a doctor's certificate is furnished stating that he has examined her and found her physically fit for the trip.

Infants And The Aged

Both infants and the aged travel by air very well providing that there is no underlying pathology which contraindicates such travel.

Transportation Of Stretcher Cases

Many of the major airlines now accept passengers whose conditions require their being transported by stretcher. From a humanitarian standpoint every effort is made to transport this type of case providing it comes within the established criteria. However, in all instances it requires special handling and careful coordination by ground personnel at the points of departure and arrival, and also by flight service personnel in flight. Stretcher cases must be accompanied by qualified attendants. Special arrangements include the transportation by ambulance, the use of forklifts at the departure and arrival points, the provisioning of special diets and oxygen requirements in flight, if necessary.

Several airlines have developed litter kits to be used in emergency. One airline[7] has placed these kits in strategic locations in the world so that they can be sent to those places where needed with the least possible delay. This kit is shown in Figure I. Its use in transporting patients is shown in Figures

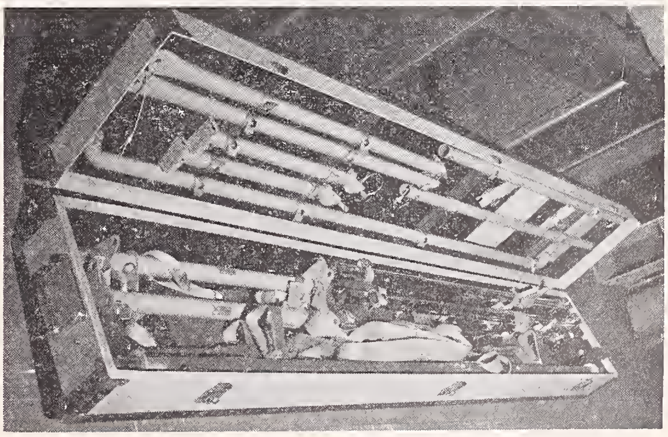

FIGURE I

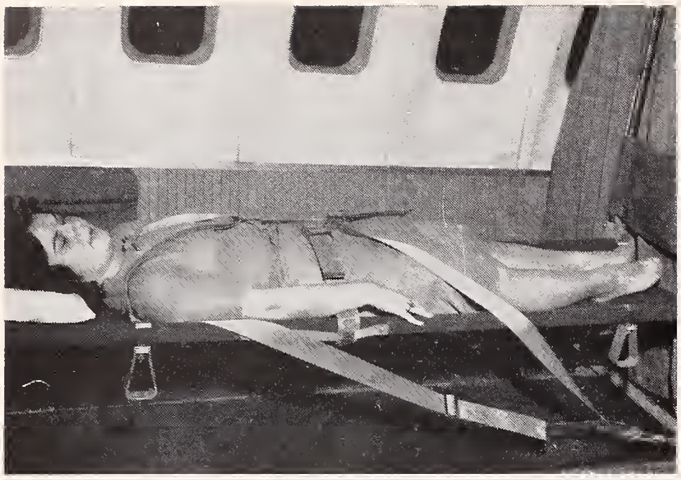

Figure II

II and III. It will be noted that provisions have been made for the necessary restraint to be used in landing, takeoff and in turbulence and also for the use of oxygen in case of loss of pressurization.

Procedures And Certification

The procedures in the acceptance of patients for travel varies a great deal among the various airlines. Information on the acceptance or non-acceptance of the incapacitated passenger has been furnished to all airlines, domestically by the Air Transport Association, and internationally by the International Air Transport Association.

It is the opinion of the author that the decision as to whether or not to accept a passenger for air travel can be determined by obtaining a minimum of essential data. This data is shown in Figure IV and is obtained through our communications system. The communication systems of the major airlines today are very efficient and in an emergency, for example, a message can be sent and an answer received half-way around the world in a period of thirty minutes. Occasionally a certificate from a local physician is desirable. The various airlines have their own certificate but with slight variations and they have essentially the same data based on the same requirements.

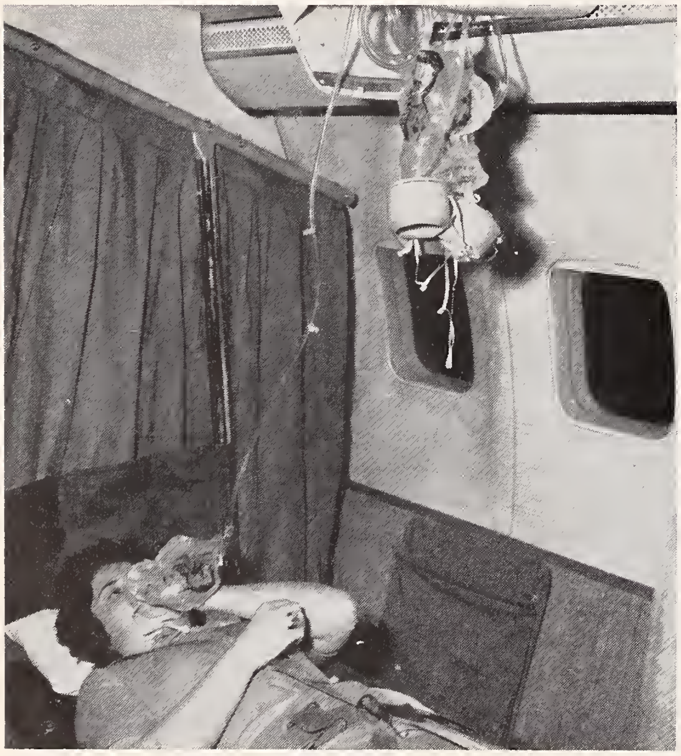

Figure III

Figure IV

Data Required in Determining the Acceptance of Incapacitated Passengers

Passenger's name .... Age ....

Flight number and date .... from .... to ....

Diagnosis and severity ....

....

Opinion of attending physician at point of departure as to whether or not the passenger can be transported* ....

....

Category of the passenger:

a. Ambulant—with or without an attendant ....
b. Wheelchair case—with or without an attendant ....
c. Stretcher case—in all instances must have a qualified attendant to care for needs of the passenger ....

* Medical certificate may or may not be required.

Interline Transfer Of The Physically Handicapped

During the past year considerable thought has been given to the interline transfer of the physically handicapped by the airline industry of the United States. Frequently lay personnel think of the person who is physically handicapped as one who has a static physical defect, such as a missing limb, or the paraplegic. However, in airline operation the entire gamut of physical and mental abnormalities must be taken into consideration.

In order to arrive at a satisfactory solution to the problems encountered in the interline transfer of the handicapped person, an *ad hoc* committee was formed consisting of traffic and medical representatives from a number of airlines and from the Air Transport Association of America. It was stated that the Medical Criteria for Passenger Flying[4] of the Aerospace Medical Association would be the accepted criteria. Procedures were outlined and guides for lay acceptance and medical acceptance were established in order to expedite the acceptance and interline transfer of the incapacitated.

Summary And Conclusions

In view of the increasing number of air travelers with the increasing number of incapacitated passengers, it is essential that the practicing physician be familiar with the problems connected with the selection of patients for air travel. Although it can be stated that if a patient can be transported, he can be transported by air, there are a few contraindications in scheduled airline operation. These contraindications have been discussed in the field of general medicine. In deciding upon the acceptability of patients for air travel, careful individualization of the factors involved is of paramount importance.

In view of the humanitarian and often life-saving aspect and its moral obligation to the traveling public, the airline industry is making every effort to accept the incapacitated passenger wherever possible. Improvement is being made in procedures in the handling of the handicapped as evidenced by the improvement in the interline transfer from one airline to another.

Transportation by air of the patient is becoming more and more comfortable. This is particularly true since the advent of the turbo-jet aircraft with its greater speed, lack of vibration, decreased noise level and improvement in pressurization.

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5. Anon: To fly or not to fly. J.A.M.A., 175: 799-800, 1961.
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7. Pan American World Airways, Inc., New York, New York

There are probably few who, having inaugurated with some success their scientific explorations, have not been obliged to weaken and detract to some extent from the pedestal of some historic or contemporary idol. In the way of classical examples, let us recall Galileo's refuting Aristotle's views in the matter of gravity, Copernicus tearing down Ptolemy's system of the universe. Lavoisier reducing to nothingness Stahl's concept concerning phlogistic principles. Virchow refuting the idea of spontaneous generation of cells assumed by Schwann, Schleider and Robin.

—Ramon Y. Cajal, *Precepts And Counsels On Scientific Investigation.*

Cardiopulmonary Conditions

Their Assessment For Criteria For Passenger Flying

LUDWIG G. LEDERER, PH.D., M.D.
New York, New York

THE booklet published by the Aerospace Medical Association, on "Medical Criteria for Passenger Flying," has been adopted as the official guide for physicians by the Air Transport Association and has been recommended to the Civil Aeronautics Board for the same purpose.

The Civil Aeronautics Board which regulates passenger carrying by commercial airlines has given a directive to the airlines to liberalize as much as possible the criteria for the carrying of incapacitated people. I am happy to report that this has been done and has been accepted by the Air Traffic Conference of America for all of the certificated airlines in the United States. This means that an agreement will exist so that, if a disabled passenger is traveling on several airlines with interconnections, he will not be refused passage by a connecting carrier as has occurred many times in the past.

In the booklet "Medical Criteria for Passenger Flying" three generalizations are made. These are:

1. A passenger must have no interference with the supply of oxygen to the lungs.

2. The mechanical expansion of gases in the air traveler must be unobstructed.

3. The passenger must not impose any untoward effects upon the sensibilities, security, and health of his fellow passengers.

With regard to the last statement that the passenger must not impose any untoward effects upon the sensibilities of his fellow passengers, I can only repeat the yardstick for passenger acceptance that was used by Colonel A. D. Tuttle, the first Medical Director of United Air Lines. Colonel Tuttle used to say that, if a passenger could walk one city block or climb one flight of steps and if he looked, talked, and smelled like any other passenger, he was acceptable. This truism still works pretty well today.

As we approach the cardiopulmonary conditions which we wish to assess today, I should like to have each of us bear in mind one question. Would we permit an individual having this clinical condition to travel by any other means such as common carrier, railroad, bus, steamship line, or personal automobile? If we would ask ourselves this question we would soon see that the majority of conditions not transportable by air are not transportable at all. We exclude individuals who can arrange to be transported by air ambulance with a professional attendant aboard.

There have been some changes recently in travel time, type of aircraft, and means of boarding with respect to long flights. Travel time has been cut by means of the jet aircraft and thus exposure time has been decreased. This will be heightened greatly as we develop the supersonic transport which will travel at two or three times the speed of sound, and the contemplated traveling time from Coast to Coast will be one hour. The means of boarding as utilized on these larger aircraft usually entails no climbing of steps. In some ways this adds to comfort but in other ways it has deprived us of a simple, fast, cardiopulmonary function test. There are several cardiopulmonary conditions which can do well in walking on a level area but when exposed to the foot-pounds of work entailed in climbing steps, do not do so well.

Orthopedic Deformities Of The Chest

The Chest Wall. Open communication between the pleura and the external atmosphere is, of course, a contra-indication because essentially one

Presented as part of a Symposium on Clinical Problems in SCUBA and Skin Diving and Passenger Flying sponsored by the New Haven Heart Association, Inc., and Yale University, New Haven, Connecticut, September 21, 1962.

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has a pneumothorax. Thus any acute injury to the chest wall if opened is a contra-indication to flight because of the differential in atmospheric pressure which is reduced somewhat even in an 8,000-foot cabin. With respect to the other soft tissues and the ribs, sternum, clavicles, scapulae, and dorsal spine, we can think of no contra-indication unless it is an acute injury which is incapacitating in itself.

Diaphragm

Paralysis. This condition is, of course, a contra-indication to flying because respiration is not automatically controlled. Patients with acute infections, like polio, are not transportable; however, after the acute phase has passed some of these can fly.

Spasm or Hiccough. If properly controlled by drugs this is no contra-indication to flight.

Subdiaphragmatic Abscess. Not transportable by any means.

Pneumoperitoneum. If recently induced, the patient should not fly; after gas is absorbed, he may fly. Trapped gas acts here to increase at altitude and cause discomfort.

Herniation. If it encroaches on lung vital capacity, the patient should be carefully evaluated before flying.

Pleura

Dry Pleurisy. If encroachment on vital capacity is fifty per cent or more, the patient should not fly.

Pleurisy with Effusion. If vital capacity is encroached upon, the patient should not fly.

Calcification and Tumors of the Pleura. Calcification is ordinarily not a problem. Tumors of the pleura again are not a problem if they do not encroach upon vital capacity.

Pneumothorax. If recently induced this is an absolute contra-indication for flying because of mediastinal shift and possible embarrassment of heart action when gas expands.

Mediastinum

Tumors of. The amount of air space displaced to reduce vital capacity will be the deciding factor in transporting such a patient by air. Each case should be individually assessed.

Hilar Glands. Same as the preceding.

Mediastinitis. These patients are not transportable by any means of travel.

Emphysema and Bronchospastic States. This is a very important group and many of these can be transported by air if properly assessed as to residual pulmonary function, properly medicated and, if necessary, arrangements are made ahead of time to provide an attendant and enough oxygen to keep the patient at sea level. These patients, if they have high CO_2 levels, should carry instructions and identification cards so that if apnea should occur they would *not* be flooded with 100 per cent oxygen. When patients such as these need or are taking stand-by oxygen, other passengers aboard may smoke providing they sit two or more seats away in all directions.

Esophageal Varicies. There is no greater danger in traveling by air than by any other means.

Trachea And Bronchi

Trachea. Patients with acute injury, when associated with displacement and edema, should not fly.

Laryngectomee. Special precautions regarding the intake of oxygen and medical identification, especially in women, should be taken. We teach our stewardesses how to take care of these people. The laryngectomee association also teaches these people about emergency oxygen procedures in aircraft.

Tracheobronchitis. An acute condition with which a person should not travel at all.

Bronchiectasis. What we have said about emphysema and bronchospastic disease applies here.

Bronchial Asthma. If properly medicated and not entering status asthmaticus the patient may fly with stand-by oxygen and emergency medication. Stewardesses can not give hypos of adrenalin. Proper medical identification should be provided for enroute care at stop-over points if necessary.

Bronchostenosis. Must be assessed individually to ascertain degree of obstruction.

Bronchial Adenoma. Same as for bronchostenosis.

Tuberculosis

Tuberculosis is adjuged, if active, as an acute contagious communicable disease and, as such, is subject to the regulations of the U.S.P.H.S. Transport of such passengers in common carrier vehicles in interstate commerce is prohibited. If arrested and no operative interference has occured, they may fly.

Diseases Of The Lungs

Pneumonia. Patients with acute, lobar, or bronchopneumonia should not travel by any means. Those with viral pneumonitis may be flown if the process is not too extensive and special arrangements are made. Encroachment on air space should be assessed.

Mycotic Infections. When stable and calcified, these usually are no problem in passenger flying.

Pulmonary Abscess. Patients may fly if properly assessed and the abscess is closed. If the abscess is open to communication with the bronchial tree, due to odor and drainage with expectoration, they are unacceptable for flight.

Pneumoconiosis. Usually acceptable. As an example, in certain atmospheric smog conditions large groups of coal miners were "air-lifted" from the Allegheny mountain region.

Emphysema. Same indications as for bronchiectasis. If pulmonary function is less than fifty per cent these patients will do poorly in unpressurized aircraft above 5,000 feet. Also one must remember that, due to lessened humidity, pulmonary secretion tend to thicken when one travels above sea level.

Pulmonary Fibrosis. Same indications as for emphysema.

Pulmonary Cysts. Same indications as for space-taking lesions such as tumors that might encroach on air space and decrease pulmonary function.

Atelectasis. Must be assessed individually and usually can not travel by any means of transportation. In infants, we do not permit travel below seven days of age because the pulmonary breathing pattern is not firmly established. This would automatically rule out atelectasis post-partum.

Carcinoma of the Lung. If terminal, they should not travel by any means. Occasionally a "mercy" flight is arranged.

There are several physiological conditions which can occur without disease processes being present. Air hunger and hyperventilation should be mentioned.

Air hunger is associated with a lessened amount of available oxygen in the ambient atmosphere at high altitudes, due to the decreased partial pressure of oxygen. This condition is encountered most commonly in unpressurized aircraft, or those in which the cabin pressurization system is not operating efficiently. True air hunger is physiologic. Frequently, however, such a state is mistakenly associated with hyperventilation or a dyspneic type of respiration which generally is the result of apprehension or anxiety. In the presence of true air hunger supplementary oxygen will alleviate the symptoms. When the dyspneic type of respiration resulting from anxiety is present, the inhalation of carbon dioxide, such as rebreathing with a paper bag or simple holding of the breath, will bring prompt relief. If oxygen is administered over long periods of time, carpopedal spasm may develop. Reassurance is calming and has a very beneficial effect in both situations. Hyperpneic tetany arising from hyperventilation is not ordinarily a cause for an unscheduled landing.

Cardiovascular Conditions

As a transition from pulmonary to cardiac conditions we could mention:

Pulmonary Infarction and/or Embolus. In the acute stage these patients should not travel by any means, but when symptom-free they may travel by air.

Arterioslcerotic Heart Disease. If *compensated* and no orthopnea exists, and they can climb one flight of steps, the patients can fly. If *mildly decompensated* wherein they can climb one flight of steps and stand-by oxygen is provided, they may fly preferably in pressurized aircraft and with short flying exposure time.

If *hypertension* exists, one should assess the diastolic pressure rather than the systolic pressure. Individuals with diastolic pressure *above* 120 mm. of Hg usually should not travel by any means of conveyance.

Rheumatic Heart Disease. Patients with or without valvular involvement should be assessed as to cardiac function by the simple test of climbing one flight of stairs. If they can they can fly.

Congenital Defects of the Heart. It does not matter what the defect is but rather the amount of oxygenation that is maintained which is significant. Many of these have required no extra care except standby oxygen to keep them at sea level.

In general, persons who exhibit evident cyanosis, severe disturbances of rhythm, persistent arrhythmias resulting in recurrent prostration, syncope, or shock-like conditions, those with markedly enlarged hearts, extreme valvular stenosis, marked exertional angina, and those with hypertensive encephalopathy should be carefully evaluated before they are advised that air flight is safe for them.

Perhaps our biggest problem is the proper assessment of the passenger with *recent myocardial infarct.* Let us divide this into three parts.

(1) The one who suffers his attack aboard the aircraft. This does not occur very often. In the certificated airlines we have approximately one cardiac death per year per two million passengers carried. I am sure there are more in surface common carriers or in private automobiles. When one considers that we have cabin attendants trained in first aid procedures; that we can, for at least thirty minutes, give a therapeutic flow of oxygen; that usually there is a fellow passenger who is a physician aboard; that we can land within thirty minutes of a large city where good hospital facilities are available; and that there will be an ambulance waiting with more oxygen available summoned by radio-telephone, what more convenient place is there to have a heart attack than on a certificated airliner?

(2) The individual who has his infarction in a city other than where he lives. This occurs often and due to the facts that, if he survives, he is in a strange locality, and it is costly since someone from his family usually joins him for the usual four to six weeks of hospital stay, he often presents a problem of over-anxiety to get back home. Most of us know that the severity of the initial attack does not always predict the vulnerability of another perhaps fatal attack. When should we permit this patient to fly home? Perhaps a few simple guide lines might help. Is he absolutely asymptomatic? Is his oxygen reserve good? Can he walk and use toilet facilities unaided. Is there any residual angina? Is arrhythmia present? All of these are important in the final decision. Five years ago we said, "Wait six months." Today we say, in a favorable case, four to six weeks! Here is one instance where many of us will permit such a patient to be carried aboard by ambulance attendants to avoid overexertion.

(3) With respect to the individual who has had a myocardial infarction in the past and who desires to travel by air, we have no contra-indications if he can pass the simple criterion of climbing one flight of steps unaided. We suggest that he be identified by medical identity card, that he fly only in pressurized aircraft, that he be armed with his own medication, and that he should ask for standby oxygen if he has any anginal symptoms.

I wish to reiterate once more that in nearly all of the clinical conditions which I have tried to cover, when one carefully assesses criteria for travel, one will find that if a patient can be transported *at all,* he can usually be transported by commercial air travel as the best, most comfortable, and safest way to go.

> An organ of action intended for practical ends, our brain seems to have been constructed not to discover the ultimate reasons for things but to determine their immediate causes and their constant relations. And this which seems little, is in reality a great deal, for having been granted the great boon of assuming activity in the unfolding of our world, of tempering it and modifying it to life's advantage, we can proceed very well without a knowledge of the essence of things.
>
> —Ramon Y. Cajal, *Precepts And Counsels On Scientific Investigation.*

Discussion On Passenger Flying

FRANK D. GRAY, JR., M.D. *Moderator*
Guest Editor
New Haven

Panelists
EARL T. CARTER, M.D., PH.D.,
OTIS B. SCHREUDER, M.D.,
LUDWIG G. LEDERER, PH.D., M.D.

BEFORE presenting the questions I should like to present a brief review of what I have learned in our afternoon session. From what our speakers have told us it seems to me that we are dealing with several problems, but two are especially important. These are the gradual decrease in the partial pressure of oxygen, and the expansion of gases within the body as altitude is increased.

We have been told of those problems which might occur in the explosive decompression of an aircraft, but to me as a physician this is a negligible consideration because it appears to be rare, and I would expect that my patient would have a much greater risk of being injured or killed during the taxi trip to the airport than because of decompression of the aircraft itself, and so I am not going to consider sudden decompression as a serious problem in evaluating my patients.

It would appear that we must consider cabin altitudes of up to about 8,000 feet for jet aircraft traveling up to 40,000 feet. We have been given some guideline as to the various medical problems in all type of patients; which type can travel comfortably and which might require special consideration. It has also been emphasized that we must use individual evaluation for each patient and we have been given the basis for making these evaluations. We have been given special information about certain diseases such as pneumothorax, and obstructive broncho-pulmonary disease in which there might be problems of the expansion of gases and hypoxia. And, finally, it has been pointed out that, under most circumstances, the passenger who can travel by any other form of transportation can probably travel by air with proper consideration for the specific precautions that have been mentioned.

To me this program has been very helpful, but of course there are many questions that arise as we think of our individual problems and I should like to ask the speakers to come to the platform now to answer these questions.

QUESTION: If a cabin pressure is 8,000 feet or more, should an infant be given a bottle on descent to prevent barotitis? Should such an infant be awakened prior to descent?

DR. SCHREUDER: I think we will all agree that infants who take a bottle or cry have less trouble with the ears. We recommend that they be awakened on descent if the cabin pressure is at a considerable altitude. There is one other facet here; the eustachian tube in the infant is comparatively wider than in the adult. They aerate much faster. The other thing is that the infant who is asleep and starts getting symptoms will cry out, and crying is one of the best ways of aerating.

QUESTION: Consider the case of a congenital heart patient with an oxygen saturation of 50 per cent. A turbo-jet at 22,500 feet is equivalent to sea level pressure within a pressurized cabin. Does a height

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DR. EARL T. CARTER, Consultant, Section of Medicine, Mayo Clinic; Assistant Professor of Medicine, Mayo Foundation, Graduate School, University of Minnesota; Rochester, Minnesota.

DR. OTIS B. SCHREUDER is Medical Director, Overseas Branch, Pan American World Airways, New York.

DR. LUDWIG G. LEDERER is Medical Director, American Airlnes, New York.

of 40,000 feet harm this patient? How high do the turbo-jets fly?

Dr. Lederer: Well, if the plane is at 22,500 feet he will be at sea level in the cabin and there is no problem at all. If he goes to 40,000, and we seldom fly at that although at the present time we are doing a lot of flying at about 38 or 39,000, I forget the exact ratio, but he would only be at 7,000 feet in a DC8 or a 707. I think that is what the charts show. Dr. Carter, how much more would that depress him from an initial 50 per cent oxygen saturation?

Dr. Carter: Let's see, at 7,000 feet the saturation would not drop much below 92-94 per cent but when you're down to 50 per cent saturation initially you're on the steep part of the oxygen dissociation curve, and a relatively large fall can occur with a relatively small drop in ambient oxygen pressure.

Question: If decompression would occur at just the point of no return on an overseas flight, what is the margin of safety in fuel and oxygen supply considering increased fuel consumption at lower altitudes and oxygen requirements for a full load of passengers if the flight continued above 10,000 to 15,000 feet?

Dr. Schreuder: Since we are flying overseas, I will answer that. These eventualities are always taken into consideration from an operational standpoint; not only the loss of pressure but other conditions too. We have an ample gas supply to go to an alternant aircraft port at all times.

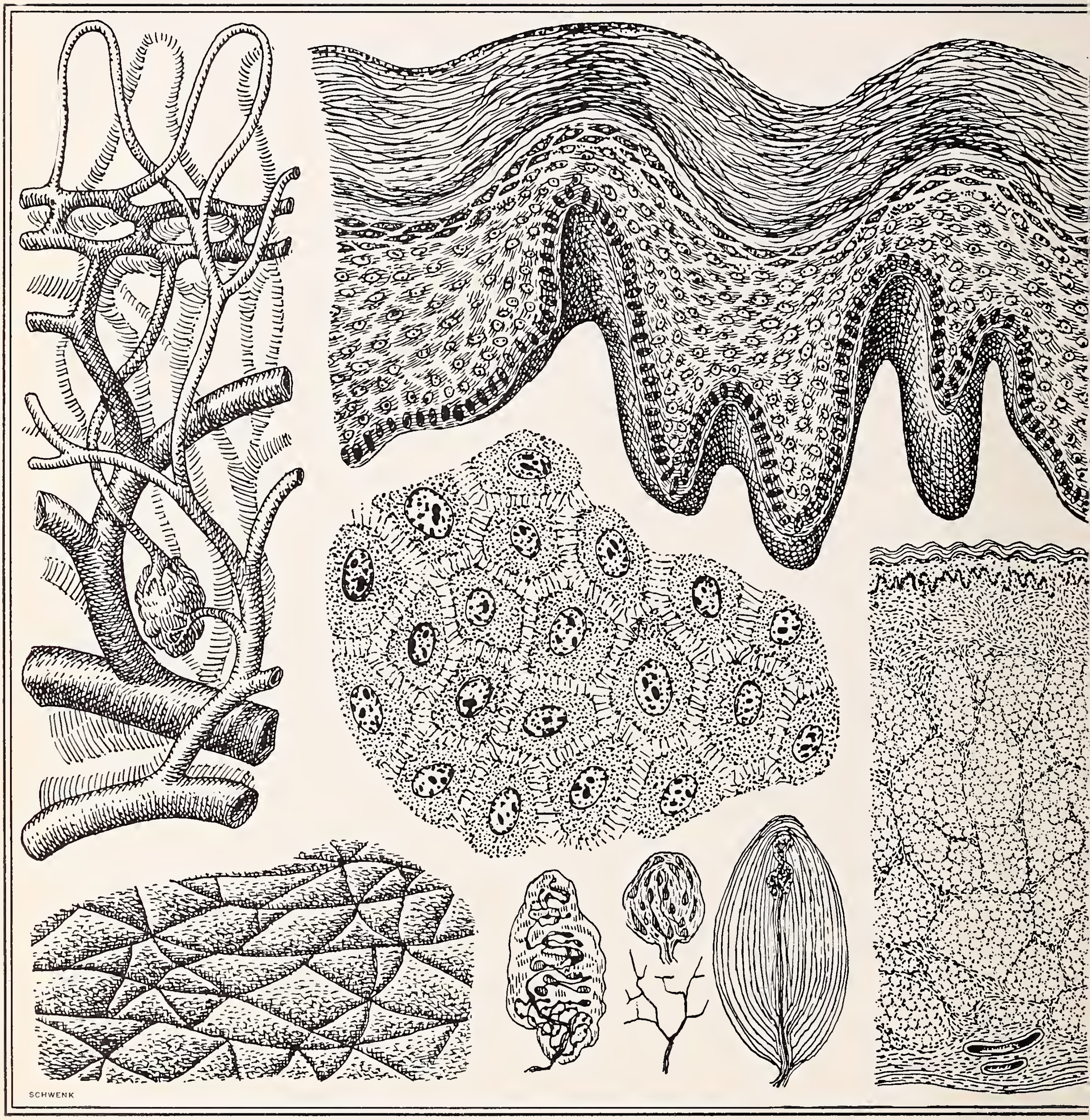
Question: Is the vital capacity a useful index of the capabilities of flying? If so, what is the critical value?

Dr. Carter: The answer is no. I am not quite sure if this question refers to tolerance to hypoxia, but the vital capacity is, in itself, not a good pulmonary function evaluation. It is too isolated a function. Of more value would be the vital capacity coupled with the maximum breathing capacity, which gives a measure of the individual's ability to move air in and out of the air passages, and also of great value would be a knowledge of his resting ventilation. You see, a patient's resting ventilation can be compared to his maximum breathing capacity. This then gives you some idea as to his reserve. If his maximum breathing capacity is, say 40 liters per minute, and at rest he is breathing 10, then he doesn't have much left to adapt to altitude, whereas if he has an MBC of 80 liters per minute, and his resting ventilation is 10, then he has a considerable reserve. Therefore of more value would be his resting volume and his MBC if you want to do a quick survey in the office. Otherwise refer him to a pulmonary physiology laboratory for a complete workup.

Question: Will you comment on the hazard of administering 100 per cent oxygen to a patient with chronic pulmonary disease and carbon dioxide retention?

Dr. Carter: This is an often heard admonition and it is true. A patient who has a respiratory difficulty and an elevated carbon dioxide tension with respiratory acidosis is in a precarious situation because if his carbon dioxide tension is 50 to 60, which is quite common in emphysema, he is very close to narcotic levels. Now, if you give him oxygen to breath, and thus raise his oxygen tension, you diminish one of the chemical drives to respiration, and ventilation will decrease. As soon as the ventilation decreases there will be a further rise in the carbon dioxide tension and it may rise into the narcotic zone. Thus the patient goes into carbon dioxide narcosis, and although his hypoxia is being corrected, carbon dioxide narcosis alone is sufficient to lead to coma and death. Now it doesn't happen suddenly. If you give oxygen to a severely emphysematous patient, it will take several hours typically and I've seen these cases occur. It is very disturbing to see a nurse's notes telling of a patient sleeping soundly, the next hour still sleeping quite heavily and difficult to arouse. A restful night, you know. By morning he is so restful you can't awaken him anymore. It can happen, and that's the mechanism, but it doesn't happen instantaneously, and you can see the impending signs of it.

Dr. Gray: The next question is the same. Apparently it had occurred to two people and I think that you have answered it very well.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Full Speed Ahead

In the May issue of *Aging,* a Department of Health, Education and Welfare publication, we were somewhat taken aback to learn (at this late date!) that the 1961 White House Conference on Aging had come up with "a series of nearly 700 recommendations" to fulfill its "nationwide commitment" to make the "late years of life more satisfying both to the individual and to society."

Just imagine that! Nearly seven hundred (687, to be exact) things which the Conference delegates felt ought to be done by *someone* if our older citizens are to live out their allotted span in happiness and contentment. Why, that figures out to a little better than one recommendation for every three people at the meeting—more than a hundred and twenty-five a day. Really big production, we'd say.

Aging reports that about 42 per cent of the suggestions have been "implemented" already. Implemented by whom? Well it turns out, as usual, that Uncle Sam has volunteered to pick up most of the tab for such things as making "direct loans for the construction of housing for the elderly," "providing financial support . . . to assist in the eradication of adult illiteracy" and seeing that "public assistance, in general, be on a total family basis." An additional 38 per cent of these "things to do," the publication tells us, have been substantially implemented, and 20 per cent (it says, with almost audible condemnation) "have not been implemented to a significant degree or at all." Among the latter group, we find, is the one which put in a plug for "health care for the aged to be financed within the framework of the Old Age, Survivors and Disability *Insurance* System." (Italics ours)

As we finished reading the article, we found ourself wondering a little as to how well most of the over-65's of our personal acquaintance would be able to absorb the impact of these six hundred and eighty-seven planned improvements if they should all ever get to be operational at about the same time. Thinking back on our own parents, for instance, we doubted somehow that they would have gone in very strong for being placed in a "special" government housing project, away from home and family, or for having a social worker drop in on Mondays, Wednesdays and Fridays to go over their ABC's with them or to see that they were keeping themselves busy with artificial flower making and other prescribed hobbies. Fact is, we think they might have rather resented so much unasked-for attention from strangers, because all their lives they had been a pretty self-sufficient couple and seemed to enjoy their retirement by continuing to do (within their means and capabilities) more or less what *they* wanted to—even if it wasn't always best for their health and welfare And our guess is that there are probably a good many like them among today's 18 million older folks who would prefer to pursue a similar course—if they're allowed to.

There's one recommendation listed in the "Forward from the White House Conference" section of the HEW pamphlet we'll gladly go along with, though, even if it's classified (with a few others) as being "not of a precise, measurable nature." That's the one somebody snuck into the report which reads: "Older people ought to be respected." Now, there's an idea we'd like to see "implemented" right off—if it hasn't been already! It's not so very original, maybe, but we like it anyway—for a number of reasons. The greatest of these is perhaps that our respect always appeared to be important to our parents, and that we gave it to them voluntarily. And a lesser source of our approbation—if it needs saying—is that this kind of giving doesn't cost our fellow taxpayers a red cent.

W.R.R.

COUNCIL MEETING — SUMMARY OF ACTIONS, May 9, 1963

At the call of the President, the organization meeting of the Council for 1963-64 was held at 160 St. Ronan Street, New Haven, on Thursday, May 9, 1963. Dr. Pitock, Chairman pro tem, called the meetng to order at approximately 1:15 P.M. and, after introducing the members of the Council, announced that nominations for the chairmanship of the Council were in order.

A count of the written ballots revealed that Stevens J. Martin, Councilor from the Hartford

County Medical Association, had received a majority of the votes cast for the nominees, and the President then declared that Dr. Martin had been elected Chairman of the Council for 1963-64.

REGULAR MEETING

I. ATTENDANCE

Present in addition to the Chairman, Dr. Martin, were: Drs. Pitock, Gilman, Cullen, Goldberg, Hess, Wiese, Sr., Scully, O'Connor, Bradley, Grendon, Davis, Hughes, Shepard, Dean, Seigle, Egan, Abbot, Spitz, Medbury. Also present were: Dr. Richards, Mrs. Lindquist, Mr. Grant Nickerson. Absent were: Drs. Gardner, Wilson, Grant, Phillips, Weber, Jr., Ciccarelli, Gevalt, Caplan, Hastings.

II. ROUTINE BUSINESS

Appointment Of Liaison Committee With CMS

The Chairman appointed the Liaison Committee with CMS for 1963-64 as follows:

Stevens J. Martin, Hartford, Chairman
Ralph L. Gilman, Storrs
Morris P. Pitock, Bridgeport
James R. Cullen, Hartford
Norman H. Gardner, East Hampton
Orvan W. Hess, New Haven
E. Tremain Bradley, Norwalk
Nicholas T. Phillips, Norwich
Henry Caplan, Meriden
Michael A. Dean, Bridgeport
William R. Richards, New Haven, ex-officio

By general agreement, and for the joint liaison meeting with CMS of May 9 *only*, substitutes for absent members were appointed as follows:

for Dr. Gardner—David A. Grendon, Sharon
for Dr. Phillips—Michael R. Scully, Bridgeport
for Dr. H. Caplan—Frank K. Abbot, Waterbury

Election Of Committee On Preliminary Study Of Censorship Questions

A Committee on Preliminary Study of Censorship Questions for 1963-64 was elected as follows:

FCMA—Ellwood C. Weise, Sr., Bridgeport Chairman
HCMA—Stevens J. Martin, Hartford
LCMA—David A. Grendon, Sharon
NHCMA—Orvan W. Hess, New Haven
NLCMA—Nicholas T. Phillips, Norwich
MCMA—Richard F. Grant, Cromwell
TCMA—David S. Hastings, Stafford Springs
WCMA—William M. Shepard, Willimantic

Ad Hoc Committee On Corporate Practice Of Medicine

The Chairman appointed this Ad Hoc Committee for 1963-64 as follows:

David A. Grendon, Sharon, Chairman
Stewart P. Seigle, Hartford
Jachin B. Davis, New Haven
David S. Hastings, Stafford Springs

Ad Hoc Committee On House Of Delegates Resolution No. 2

The Chairman appointed this Ad Hoc Committee for 1963-64 as follows.

E. Tremain Bradley, Norwalk, Chairman
Frank K. Abbot, Waterbury
Nicholas T. Phillips, Norwich
Lavius A. Robinson, Jr., Danielson
Norman J. Barker, Bloomfield
Albert L. Larson, Hartford

Approval Of Minutes

It was VOTED to approve the minutes of the meeting of April 17, 1963, as printed and distributed.

Date Of Next Meeting

It was VOTED to authorize the Chairman and the General Manager to call the next regular meeting on a date appropriate to the business to be transacted. Should developments regarding CMS require it, a separate meeting to consider such developments is to be called when deemed necessary by the Chairman.

III. OLD, NEW AND SPECIAL BUSINESS

Connecticut Medical Service, Inc.

The bulk of the meeting was given over to reviewing the problem with CMS, Inc. relating to the election of the Council's nominees as CMS Directors, and the Resolution adopted by the House of Delegates on April 30, 1963 directing the Council to take "appropriate legal action," if necessary, to "compel the Corporators of CMS, Inc. to seat as CMS Directors the three nominees of the Council in question"; and to discussing with legal counsel (Mr. Grant Nickerson of Wiggin and Dana, New Haven) how the Liaison Committee was to proceed at the meeting to be held with CMS later in the afternoon and what course or courses of legal action could be initiated by the Council, if necessary.

It was VOTED to authorize Mr. Nickerson to attend the joint meeting of the CMS and CSMS Liaison Committees and to present the official position of the Society on the matter in question.

N.B.: *The foregoing is a summary of the proceedings and actions of the Council on May 9, 1963. Detailed minutes of the meeting are on file at 160 St. Ronan Street, New Haven, perusal by any interested member of the Society.*

COUNCIL MEETING SUMMARY OF ACTIONS

May 29, 1963

I. ATTENDANCE

Present in addition to the Chairman, Dr. Martin, were: Drs. Pitock, Gilman Goldberg, Hess, Weise, Sr., Gardner, Scully, Wilson, Grendon, Davis, Shepard, Weber, Dean, Ciccarelli, Gevalt, Egan, Abbot, Caplan, Spitz, Hastings, Medbury. Also present were: Mrs. Lindquist and Dr. Richards. Absent were: Drs. Cullen, O'Connor, Bradley, Grant, Phillips, Hughes, Seigle.

II. ROUTINE BUSINESS

Approval Of Minutes

It was VOTED to approve the minutes of the meetings of April 30, 1963 and May 9, 1963, as printed and distributed.

Life Membership

It was VOTED to approve applications for Life Membership for eligible Active Members as follows:

Francis E. Tierney, West Hartford (HCMA)
Edward T. Wakeman, West Haven (NHCMA)

Committee Resignations, Appointments, Etc.

Committee on Health Careers: It was VOTED to accept the resignation from this Committee of Allan F. Delevett, Bridgeport. It was further VOTED to appoint Thomas L. Cronan, Trumbull, to replace Dr. Delevett as a committee member.

Advisory Committee on Medicare Plan, etc.: Henry A. Archambault, Norwich, having submitted his resignation as a member of this Committee, it was VOTED to appoint Frederick B. Hartman, New London, (a surgeon) to the Committee as a representative of the NLCMA. It was further VOTED to accept the resignation of Robert W. Hart, Hamden, as chairman of the Committee and to appoint Robert R. Berneike, New Haven, to succeed Dr. Hart as chairman.

Committee on Public Health: It was VOTED to accept the resignation of James V. Macgregor, Darien, from membership on this committee.

Committee to Study Perinatal Morbidity and Mortality: It was VOTED to accept the resignation of Andrew F. Turano, Middletown, from membership on this Committee.

Commitee on Rehabilitation: It was VOTED to appoint Earl E. VanDerwerker, Hartford, to membership on this Committee.

Representative to Connecticut Health League: It was VOTED to accept the resignation of William L. West, Derby, as one of the Society's three representatives to the Connecticut Health League. It was further VOTED to appoint Morris A. Granoff, New Haven, to succeed Dr. West as a representative to the CHL for the remainder of his term, 1961-1964.

Committee to Study Maternal Mortality and Morbidity: It was VOTED to accept, with regret, the resignation of Eric H. Blank, New London, from membership on this Committee. It was further VOTED to appoint Joseph T. Murray, New London, a member of the Committee.

Cancer Coordinating Committee: It was VOTED to accept the resignation of Forbes Delaney, Greenwich, as a member of the Committee. It was further VOTED to appoint Herbert V. von Gal, Greenwich, to replace Dr. Delaney on the Committee. Dr. von Gal has succeeded Dr. Delaney as Chairman of the Tumor Committee at the Greenwich Hospital.

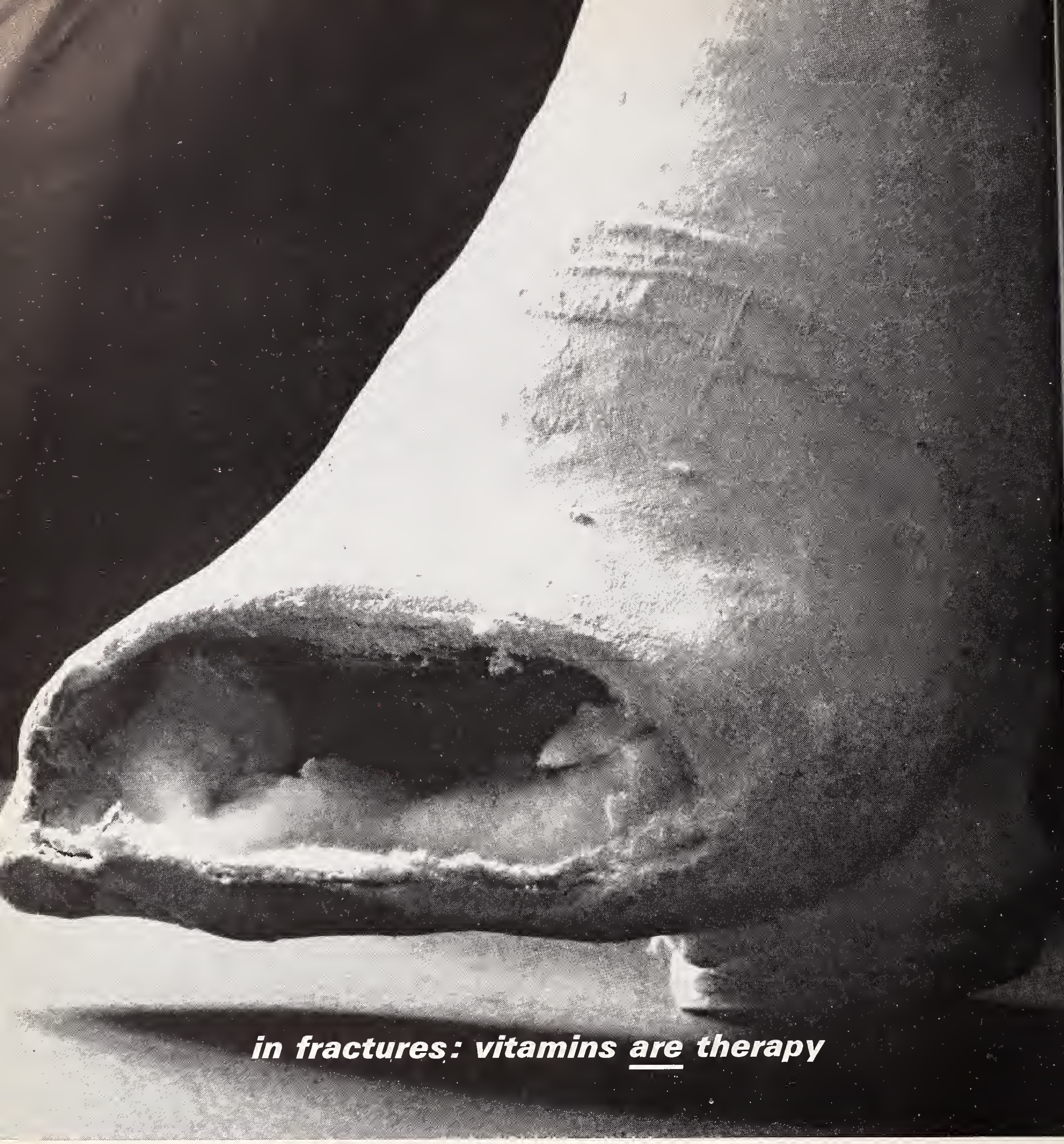
Committee Requests, Recommendations, Etc.

Committee on Mental Health: It was VOTED to authorize the Committee to "obtain a legal opinion from the Society's counsel (Wiggin and Dana, New Haven) as to the legal responsibilty of a psychiatrist who cooperates professionally with a psychologist who is treating a patient whom the psychiatrist has never seen but whose treatment he is supposedly supervising." A report to the Council in this matter is expected.

Committee on Public Health: It was VOTED to authorize Joseph J. Bellizzi, Hartford, to attend the Ninth National Conference on Physicians and Schools, Chicago, October 10-12, 1963, and to reimburse Dr. Bellizzi for usual expenses incurred by him as a result of his attendance at the Conference. A report to the Council on the proceedings of the meeting is expected.

Committee to Study Surgeon's Total Responsibility: It was VOTED to authorize Jacques H. Green, New Haven, an Ad Hoc Committee of One appointed by the Council, to consult with the Society's legal counsel (Wiggin and Dana, New Haven) regarding "the total responsibility of the attending surgeon for all aspects of care rendered to his hospitalized patient." Dr. Green is expected to inform the Council of the legal opinion received from counsel in this matter.

Conference Committee with the State Bar Association: It was VOTED to authorize the Committee to contribute an additional $73.73 to the jointly-fiinanced Medico-Legal Symposium which was held on March 18, 1963 in conjunction with the Connecticut Bar Association. The Bar Association is reported to have contributed an equal amount to defray the deficit above the $325 originally authorized.



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Ad Hoc Committee on Medical Research: It was VOTED to discharge this Committee, with thanks, on the recommendation of its Chairman that "the function of the Committee has been terminated by the favorable action of the State Legislature on the 'Humane Research Bill.'" It was further VOTED to table action on the suggestion that "a new Committee on Medical Research" might be established.

Committee on Aging: It was VOTED that the Society not become an organizational member of the National Council on Aging.

Exemptions From CSMS Dues

It was VOTED to approve exemptions from CSMS membership dues as follows:

John A. Gerda, FCMA, 1962 and 1963 a/c postgraduate education.

Aida McKellar, FCMA, 1963, a/c postgraduate education.

Joseph M. Gromults (NHCMA), 1963 a/c military service.

Wichard A. J. vanHeuvan, (NHCMA), 1963 a/c military service.

Rowe A. Castango (HCMA), 1963, and indefinitely, a/c physical disability.

Interim Appointment—Alternate AMA Delegate

It was VOTED to appoint Michael A. Dean, Bridgeport, an Alternate Delegate to the American Medical Association to complete the unexpired term (1/1/60—12/31/63) of Vincent A. Gorman, Bridgeport (deceased). Dr. Dean was elected to a full three year term as an Alternate AMA Delegate on April 30, 1963, and will take this office in his own right on January 1, 1964.

Date Of Next Meeting

The next Council meeting will be on Thursday, June 27, 1963.

III. OLD, NEW AND SPECIAL BUSINESS

Reports Of Council Committees

Committee on Study of Censorship Questions: Ellwood C. Weise, Sr., Chairman reported that he has received needed information from legal counsel as to procedure which the Committee should follow, and that he has also received files from HCMA and FCMA on the two cases in which disciplinary decisions of the county associations had been appealed. For a number of reasons which he specified in a letter to Dr. Martin, Dr. Weise expressed a desire to withdraw from the Committee, both as chairman and as a member. It was VOTED to accept, with regret, Dr. Weise' resignation from the two posts indicated. It was further VOTED to elect Michael R. Scully a member of the Committee from the Fairfield County Medical Association and to designate Dr. Scully to be chairman of the Committee.

Committee to Study and Report on the Corporate Practice of Medicine: David A. Grendon, Chairman, reported briefly on the first meeting of his Committee members held jointly with representatives of the Connecticut Hospital Association on May 22, 1963. Beyond reporting that some progress was made in attempting to define areas of mutual interest, Dr. Grendon had little specific information to convey to the Council. He indicated, however, that further meetings are to be arranged between the two groups. It was VOTED to accept Dr. Grendon's report.

Other Reports

Norman H. Gardner reported on a recent meeting of the Council on Medical Education and Licensure, which he attended in Chicago. He reported that the internship quota problems were thoroughly discussed and that the Council on Medical Education was making recommendations to the House of Delegates which embodied the same thoughts as the resolution to be introduced by the Connecticut Delegates. It was VOTED that if the Connecticut AMA Delegates felt that the introduction of the Society's resolution was redundant, they could withdraw it.

Sites For Annual Meetings

For the Year 1964: It being New Haven County's turn to act as host for the 1964 Annual Meeting of the Society, the councilors from NHCMA were requested to obtain a decision from their Board of Governors in this regard. Drs. Davis, Abbot, and H. Caplan joined in the opinion that NHCMA would be pleased to forego the opportunity to host the meeting next year in favor of holding it again at the Statler-Hilton Hotel in Hartford. The General Manager's office was directed to make arrangements with the Statler to reserve suitable dates for the 1964 Annual Meeting.

For the Year 1965: It was VOTED to authorize Clifford E. Wilson, Norwich, to investigate the suitability of the Griswold Hotel in Groton as a possible site at which to hold the Annual Meeting of the Society in 1965, and to report his findings to the Council.

Resolution From House Of Delegates

The following Resolution was received by the Council from the House of Delegates (April 30, 1963):

"WHERAS: 1. The cost of hospital care reflects directly on the medical profession. 2. Hospital costs are, and have been, skyrocketing. 3. No

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A combination of the four most widely used drugs for treatment of asthma. Each tablet contains Aminophylline 130 mg., Ephedrine HCl 16 mg., Phenobarbital 22 mg. (Warning: May be habit forming), Potassium Iodide 195 mg.—compounded for prompt absorption and balanced action, and buffered for tolerance.

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adequate means exist for determining the value received for the dollar spent on hospital care, therefore be it

RESOLVED: That the Connecticut State Medical Society institute a realistic appraisal of hospital costs and accounting procedures, and be it further

RESOLVED: That the Connecticut State Medical Society urge the State Insurance Commissioner to set a positive limit of payment by insurance companies, for hospital and medical services, of no more than 100 per cent of actual costs where insurance coverage is being provided by multiple insurance companies."

It was VOTED to refer the first "Resolve" of the Resolution to the Committee on Hospitals for study and report to the Council.

It was VOTED to refer the second "Resolve" of the Resolution to the Committe on Third Party Payments for study and report to the Council.

Advisory Committee on Hospital Licensing

A letter was received from Franklin M. Foote, State Commissioner of Health, in which Dr. Foote reported on his meeting with representatives of the Council to discuss the desirability, functions, etc., of an Advisory Committee appointed by the Council assisting the Commissioner, on request, in resolving questions which may "involve staff organization within the hospital to provide adequate control of the quality of various clinical services." Dr. Foote stated that, having received a favorable response to his suggestion from the Council's representatives with whom he met, he was now formally asking the Council to make suitable arrangements so that, on request, a suitably composed Advisory Committee (as to geographical location and type of practice) could be appointed by the Council to assist him in the matters indicated. He suggested that the basic committee should have representatives of general practice, surgery, anesthesiology, pathology, pediatrics, internal medicine and obstetrics and gynecology, with other types of practitioners to be appointed to help with specific questions relating to a particular type of practice. It was VOTED that, when a request was received from the Commissioner of Health, the Chairman of the Council and the General Manager be responsible for appointing a suitable Advisory Committee; that the Chairman communicate to Dr. Foote the Council's approval of his request, and inform him of the method by which an Advisory Committee will be appointed, when asked for by him; and that the Chairman (or a designated member) of the Committee on Hospitals shall be a member of each such Advisory Committee appointed.

The Medicare Contract For 1963-64

It was VOTED to approve the Medicare Contract for 1964, in the form recommended by the Advisory Committee on Medicare Plan.

Connecticut Society On Medical Research

In response to a letter from Averill A. Liebow, Chairman of the CSMR, it was VOTED to inform Dr. Liebow of the Council's regret that space at 160 St. Ronan Street is already being utilized fully and that therefore his request to be provided with part-time facilities in the Society's building cannot be granted. It was further VOTED that the President write to Dr. Liebow informing him of the Council's decision not to accept organizational membership in CSMR and the reasons therefore, and suggesting to him that CSMR might be interested in soliciting individual members of the Society for supporting funds. It was further VOTED that the Council express its approval, in principle, of the purposes and objectives of the Connecticut Society for Medical Research.

Connecticut Medical Service, Inc.

Printed minutes of the joint meeting of the Liaison Committees of CSMS and CMS on May 9, 1963 had been distributed to all members of the Council, and were enlarged upon by the Chairman and other members of the Council's liaison component. Following considerable discussion of pertinent developments in the present controversy over the election (or failure thereof) of three of the Council's nominees, it was VOTED that the Council express agreement that, if the CMS Corporators take action as expected and in accordance with their announced intention to amend the CMS Bylaws in the manner outlined at the liaison meeting of May 9, Mr. Nickerson (of Wiggin and Dana, New Haven) be authorized to proceed to take whatever legal action he believes to be necessary without further prior consultation with the Council.

It was further VOTED that all members of the Society be informed of any legal action taken by counsel in this matter, by direct special mailing if deemed advisable, at such time and in such form as are recommended by counsel.

Advertisement For I.V. Technicians

The following newspaper advertisement, appearing in *The Hartford Times* on May 20, 1963, was brought to the attention of the Council:

"Female Help Wanted

> I.V. Technician—Administer solutions to patients. A high school diploma is required, with a strong aptitude for detail and accuracy. Good salary. Apply Personnel Department, Hartford Hospital."

After considerable discussion, it was VOTED to direct the Chairman of the Council to write to the president of the staff at the Hartford Hospital, inquiring as to the details of the plan to train high school graduates (as outlined in the advertisement) to render IV therapy to patients at that institution, and to acquaint the Commissioner of Health of the Council's interest in such a plan and of the inquiry which the Chairman is to make of the staff president concerning it.

Study Of Indigency Among Physicians

It was VOTED to adopt a motion, prepared by Drs. Pitock and Hess, as follows:

IT IS MOVED: That the Chairman of the Council appoint a committee to investigate the need for establishing a means by which the Society and/or its component medical associations might assist those members of the Society who, due to unforseen or catastrophic circumstances, are in need of assistance; and to recommend the means for accomplishing this purpose, if found necessary.

The Budget Committee For 1964

It was VOTED that the Chairman of the Council appoint a Budget Committee for 1964 before July 1, 1963, such Committee to include a majority of members who served last year, and to recommend that the Budget Committee for 1964 hold one or more meetings for orientation purposes prior to the meeting (s) at which the budget for 1964 is actually determined.

Nominees To The Mental Health Advisory Council

Having received notice from Wilfred Bloomberg, Commissioner of Mental Health, that his Department "is embarking on a two-year comprehensive planning program for Mental Health Services in Connecticut (financed by a Federal Grant-in-Aid)"; that an Advisory Council to the study "is being created and will be appointed by invitation of the Governor;" and that the Society is invited "to nominate up to three candidates for membership on the Advisory Council . . . from which one will be chosen," it was VOTED that the Chairman of the Council designate three nominees for service with the Advisory Council to the projected mental health service study, it being understood that the Governor is to appoint only one representative from the Society. Commissioner Bloomberg suggests that the nominees "be men who can speak for organized medicine in Connecticut (and) who are either generalists or specialists other than psychiatrists."

Laboratory Services—Health Department

Having been informed by the Committee on Public Health and others that appropriations (1963-65) for the State Health Department presently under consideration by the General Assembly may require a curtailment of certain important clinical and sanitary laboratory services during the next biennium, it was VOTED to direct the General Manager to send telegrams to the Governor, the majority leader of the Senate and the majority leader of the House of Representatives urging that they consider the possible effects such curtailment might have, as follows:

(a) Making unavailable to near-needy and low-income residents certain clinical laboratory services which are important to their medical care.

(b) Reducing the scope and frequency of certain sanitary services in such areas as routine sampling of milk, water and food.

N.B.: *The foregoing is a summary of the proceedings and actions of the Council on May 29, 1963. Detailed minutes of the meeting are on file at 160 St. Ronan Street, New Haven, for perusal by any interested member of the Society.*

1963 MEETINGS

September 27—38th Connecticut Clinical Congress to be held at the Yale-New Haven Medical Center.

October 13-16—Nurses Conference, sponsored by District I of the American College of Obstetricians and Gynecologists will be held at the Hotels Statler and Bond, Hartford, Connecticut, from Sunday, October 13th through Wednesday noon, October 16th.

October 16-19—Annual Meeting of District I of the American College of Obstetricians and Gynecologists will be held at the Hotels Statler and Bond, Hartford, Connecticut, from Wednesday, October 16th through noon on Saturday, October 19th.

October 24—180th Semi-Annual Meeting of the New Haven County Medical Association will be held on Thursday, October 24, 1963 at the Waverly Inn, Cheshire, Connecticut. The Business Meeting is tentatively scheduled for 2:30 P.M.

December 4—Annual Meeting of the Connecticut Society of American Board Surgeons, Inc.

1964 MEETINGS

June 14-19—The VII Interamerican Congress of Cardiology will be held in Montreal, Canada.

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Clinical Medicine

The Serotonin Story

How Science Grows

Louis H. Nahum, m.d.
New Haven

Some years ago, cardiovascular studies in Page's laboratory were not going well because of interference by a vasoconstrictor material that appeared when the blood clotted.[1] Rappoport et al decided to try to isolate this "interfering nuisance" in order that the experiments could proceed. They succeeded and reported their results in 1948. It turned out to be five hydroxytryptamine—serotonin. It was clear enough that wherever a clot formed, serotonin was liberated and vasospasm was induced. Obviously this was a special situation and what its function in the body really was required much work. In fact, for a while serotonin was referred to as a "hormone in search of a function."

Its chemical nature established, it was inevitable that its occurrence in the body tissues and fluids and its physiologic role would be subjects for intensive research. It soon became clear that it occurs normally in several body tissues and could be shown to have powerful effects on nearly all biologic systems. But what normal and what abnormal functions serotonin may mediate is still a large and intriguing task for the future. Suffice it to say that the gradual unfolding of its theme has been undertaken by scientists whose primary interests included cardiovascular, mental, endocrine, dermatologic and even neoplastic disease. It has been found to be present in the brain and was thought to be a neurohormone. In fact, the hallucinogenic effects of lysergic acid diethylamide (LSD) were thought to be due to the serotonin antagonistic action of this compound. Then it was observed that the carcinoid syndrome was due to large quantities of serotonin produced by neoplastic tissue. Udenfriend et al,[2] identified the major urinary metabolite of serotonin, 5-hydroxyindolacetic acid and this became an important aid in the diagnosis of this condition.

The effects of serotonin on the cardiovascular system reads like an exercise in the development of our knowledge about the scientific method. As stated above the vasoconstrictor effects of serotonin was the first one observed. Nevertheless the usual effect of very small and more nearly possible physiologic amounts is vasodilatation and a fall in arterial pressure. Especially is this the case when there is normal or increased neurogenic vasoconstriction. In the absence of sympathetic vasomotor activity serotonin is invariably vasoconstrictor and pressor. Thus we have a curious anomaly, the degree of activity of the sympathetic nervous system and hence the degree of neurogenic vasoconstriction, appears to be by far the most important determinant of response to serotonin.

A hypothesis now could be formulated that the small amounts of normally occurring serotonin may participate in the regulation of blood flow by influencing the degree of response to neurogenic vasoconstrictor impulses. But such a mechanism is unique as far as is known and its validation can only be pursued if one first recognizes the complexity of the types of effects of the sympathetic nerve endings on the cardiovascular system. Up to the present time three such effects have been recognized; the one most commonly associated with this system, the constrictor action: a second is the dilator responses to adrenergic neurohormones in muscles and heart, a third is the dilator response that results from acetylcholine and similar agents. Thus if one perfuses the vascular beds in which the different effects predominate one can measure the effect of serotonin on the different receptors.

Dilator receptors that respond to acetylcholine can be made insensitive by administration of atropine. When this was done the vasodilator action of serotonin was unchanged. This observation can only mean that the sympathetic receptors sensitive to acetylcholine do not participate in the action of serotonin.

The next question obviously was whether serotonin blocks adrenergic vasoconstrictor receptors, or interferes in some way with the action of norepinephrin. The simplest way to test this hypo-

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DR. LOUIS H. NAHUM, Lecturer in Physiology, Yale University School of Medicine, New Haven. Consultant in Medicine, Hospital of St. Raphael, New Haven. Griffin Hospital, Derby. Middlesex Hospital, Middletown. Cardiologist at Milford Hospital, Milford.

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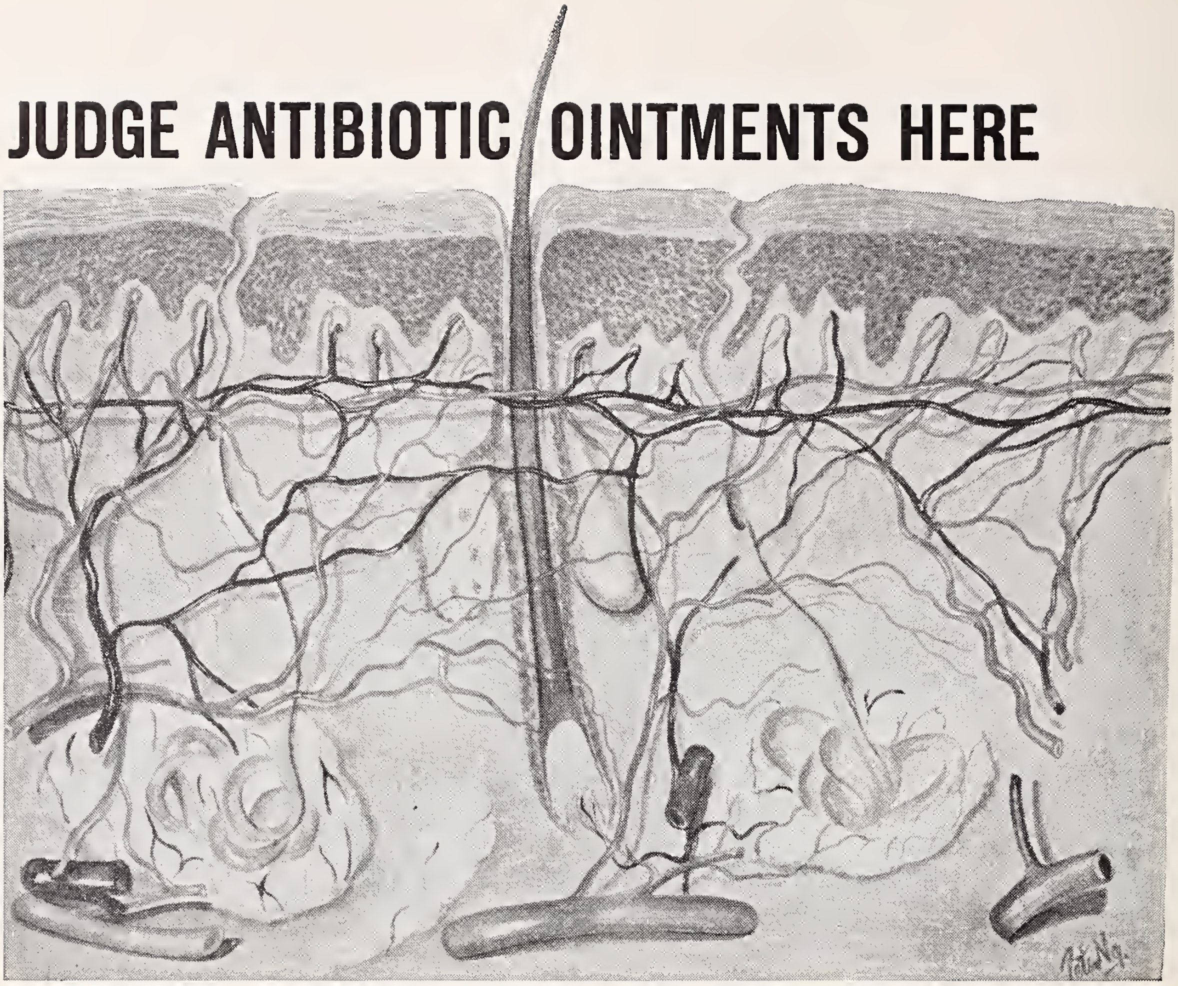

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thesis was to administer norepinephrin and see if serotonin interferes with its action. The results were clear cut and indicated that serotonin in no way modified the action of injected norepinephrin. Since the action of injected norepinephrin is the same as that caused by nerve stimulation, it was astonishing to find that serotonin caused marked inhibition of constrictor responses to nerve stimulation. There was left only one remaining possibility; namely, that serotonin has an effect on the adrenergic vasodilator receptors. How to test this hypothesis remained a problem.

Perhaps this problem could be approached through epinephrin which differs from norepinephrin in being able to stimulate both adrenergic constrictor and dilator receptors, although the net effect in most vascular beds is generally vasoconstrictor. In an animal that was given epinephrine first, serotonin caused slight inhibition of the vasoconstrictor response. The suggestions then arose that the stimulating effect of epinephrine on dilator fibers was somehow enhanced by serotonin. This hypothesis can be further pursued by electrical stimulation of sympathetic nerves after administration of serotonin. If during stimulation of the dilator receptors, the dilator response is made more prominent, then one would expect a decrease in the total vasoconstrictor response or relative vasodilatation. This was exactly what happened. The last step was to determine what would happen if the vasodilator receptors are made inactive by a selective blocking agent. In this experiment serotonin completely lost its ability to inhibit neurogenic vasoconstriction. There is thus demonstrated an interplay between serotonin and the sympathetic vasomotor sytsem in which serotonin can modify cardiovascular function by increasing the action of the sympathetic vasodilator receptors.

The story, however, is considerably more complex than the purely local effects upon peripheral sympathetic vasodilator receptors. Serotonin also has a central effect upon the vasomotor centers that modify the sympathetic outflow to the cardiovascular system. Since serotonin occurs normally in brain tissue and is in especially high concentration in the hypothalamus, a logical question is what might it be doing there? Had it not been for the discovery of reserpine and its blood pressure lowering effects the serotonin story would still be lagging.

Measurements of electric activity of the splanchnic nerve which is largely preganglionic revealed that part of the hypotensive effect of reserpine depends upon its action on the central nervous system. After reserpine administration the impulses picked up in the splanchnic nerve, slowly diminished. Clearly this indicated a central effect that causes diminution of sympathetic outflow. If this conclusion is valid then administering reserpine in small doses into the lateral ventricle, should cause lowering of arterial pressure and inhibition of cardiovascular reflexes. This prediction was fully fulfilled. However, small doses of reserpine given intravenously produced no such effects. Perhaps the central action of reserpine is due to its ability to liberate other amines, since it had already been shown by others that reserpine causes release of serotonin and norepinephrin from their bound form in body tissues.

A postulate was now inevitable that perhaps the central effect of reserpine on vasomotor activity depends upon the release of these amines. If this were so then serotonin injected into the ventricles should reproduce the effects of reserpine. It did, and norepinephrin was found to have the same effect. How could these effects be produced? Did these amines directly stimulate the vasoconstrictor centers or did they constrict the blood flow to these centers and produce their effects indirectly. The question was easily answered because vasodilator drugs completely abolished the central action of the amines on the vasoconstrictor center. The conclusion seemed inescapable that the central effect of reserpine on vasomotor activity appears likely to depend on the release of serotonin and norepinephrin from their bound forms and the activity of these amines once released depends upon their ability to cause vasoconstriction and local changes in blood flow to the vasoconstrictor center.

What we do not yet know is whether continuous release of small amounts of serotonin or norepinephrin occurs normally and is a factor in the physiologic regulation of vasomotor activity and therefore of arterial pressure.

The serotonin story is a wonderful example of the two kinds of discovery in science by means of which knowledge grows. One is the ability to recognize an anomaly and search for its cause and meaning. This the Cleveland researchers did when an "interfering agent" causing vasoconstriction interfered with their then active studies on blood pressure. When serotonin was isolated, active pursuit of its physiologic function led to predictive deductions from generalizations already known in functions of the sympathetic nervous system. Experimental verification of these deductions unfolded a complex and fascinating story of brain and vascular system effects and the end is not yet in sight.

REFERENCES

1. McCubbin, James W.: A vexing hormone—serotonin. Cleveland Clinic Quarterly. 29:73, 1962.

2. Udenfriend, S., Weissbach, H., Titus, E., and Peterson, R. E.: Biogenesis and metabolism of 5-hydroxy-indole compounds. J. Biol. Chem., 219:335, 1956.

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Statler Hilton, Boston—November 13, 14, 15, 1963

Wednesday, November 13, 1963

8:00- 8:45 Movie, Discussion

9:00-10:30 Panel: Recent Advances in Diabetes Mellitus
Moderator: Alexander Marble, M.D., Joslin Clinic, Boston

10:40-11:20 Lecture: Sensible Management of Fluid and Electrolytes in Surgical Patients
Mark A. Hayes, M.D., Professor of Surgery, Yale University School of Medicine

11:20-12:15 Lecture: Diuretics in Treatment of Edema
Norman G. Levinsky, M.D., Massachusetts General Hospital

8:00- 8:45 Movie, Discussion

9:00-10:30 Hospital Clinic—Common Obstetrical Problems Demonstrations with Manikin
Robert H. Barker, M.D., Boston Lying-In Hospital

10:40-12:15 Panel: Dangers of Drugs in Pregnancy and the Newborn
Moderator: Jerold Lucey, M.D., University of Vermont School of Medicine
Louis Gluck, M.D., Yale University School of Medicine
John F. Crigler, Jr., M.D., Children's Hospital, Boston

12:30 Luncheon

Practical Office Psychotherapy
William E. Schumacher, M.D., Director, Bureau of Mental Health, State of Maine

2:15 Symposium: Therapy of Breast Cancer from Start to Finish
Moderator: Francis D. Moore, M.D., Peter Bent Brigham Hospital, Boston

Thursday, November 14, 1963

8:00- 8:45 Movie, Discussion

9:00-10:20 Symposium: Cerebrovascular Disease: Medical and Surgical Aspects
Moderator: Joseph C. Foley, M.D., Western Reserve University School of Medicine
Common Syndromes and Their Diagnosis: George A. Schumacher, M.D., University of Vermont Medical School
Role of Neurosurgery in Carotid Diseases and Intercranial Aneurysms: Charles A. Fager, M.D., Lahey Clinic, Boston

10:40-12:15 Symposium (continued)
Strokes: Big and Little—To Anti-coagulate or Not
Rehabilitation for Cerebrovascular Victims

8:00- 8:45 Movie, Discussion

9:00-10:20 Hospital Clinic—Physical Fitness and Athletic Injuries, New England Style
Moderator: Daniel F. Hanley, M.D., Bowdoin College, Maine
Physical Fitness—Warren R. Guild, M.D., Peter Bent Brigham Hospital
Athletic Injuries—Daniel F. Hanley, M.D.
Ski Injuries—Lawrence Crane, M.D., U. S. Winter Olympic Team Physician
Demonstration: Protective Wrappings, Knees, Ankles, Wrists—Mike Linkovich, Bowdoin Athletic Dept., Carl Nelson, Colby College Athletic Dept.

10:40-12:15 Panel: The Latest Treatment of Common Skin Diseases
Moderator: John L. Fromer, M.D., Lahey Clinic
Acne & Seborrhea—June C. Shafer, M.D., Washington, D. C.
Fungus Infections—Robert F. Tilley, M.D., Massachusetts General Hospital
Psoriasis, New Topical Treatment with Saran Wrap & Intralesional Steroids—Murray J. Tye, M.D., Tufts University School of Medicine
Photosensitivity, A Mounting Threat—Otis F. Jillson, M.D., Hitchcock Clinic, Hanover, N. H.

12:30 Luncheon

2:30- 2:40 Gem Lectures

2:30 Management of Hepatic Coma: William A. Tisdale, M.D., Dartmouth Medical School

2:45 Common Eye Problems: Paul A. Chandler, M.D., Associate Professor Ophthalmology, Harvard Medical School

3:00 Nasal Injuries, Poor Late Results Can Be Avoided: David King, M.D., Lahey Clinic

3:15 Dizziness May Mean Many Things: John F. Sullivan, M.D., Pratt Diagnostic Clinic, Boston

2:30- 2:40 Panel: Genetics Applied to Every-day Medicine
Moderator: Herbert A. Lubs, Jr., Instructor in Medicine, Yale University School of Medicine
O. J. Miller, M.D., Columbia University College of Physicians & Surgeons

4:00 Clinicopathological Conference—Presented by Massachusetts General Hospital

Friday, November 15, 1963

8:00- 8:45 Movie, Discussion

9:00-10:20 Panel: Use and Abuse of Adrenal Steroids
Moderator: George W. Thorn, M.D., Peter Bent Brigham Hospital

10:40-12:15 Panel: Management of Obscure Fevers
Moderator: Paul B. Beeson, M.D., Yale University School of Medicine
Philip A. Tumulty, M.D., Johns Hopkins University School of Medicine
Ivan L. Bennett, Jr., Johns Hopkins University School of Medicine
Morton N. Swartz, M.D., Harvard Medical School

8:00- 8:45 Movie, Discussion

9:00-10:20 Hospital Clinic—What Every Doctor Should Know About Cardiac and Respiratory Resuscitation
Moderator: James A. Bougas, M.D., Overholt Thoracic Clinic, Boston
Bernard Lown, M.D., Peter Bent Brigham Hospital
Joseph B. Crehan, M.D., Lahey Clinic
Medicolegal Aspects—B. U. Speaker

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*AMA Council on Foods and Nutrition: The Regulation of Dietary Fat, *JAMA* 181:411-423 (August 4, 1962).

**AMA Council on Foods and Nutrition: Composition of Certain Margarines, *JAMA* 179:719 (March 3, 1962).

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0:40-12:15 Panel: Practical Aspects of Chronic Bronchitis and Pulmonary Emphysema

Moderator: Theodore L. Badger, M.D., Boston City Hospital

12:30 Luncheon

Recent Progress in Diagnosis and Treatment of Syphilis

Nicholas J. Fiumara, M.D., Director, Division of Venereal and Communicable Diseases, Department of Public Health, Commonwealth of Massachusetts

2:30- 3:40 Gem Lectures

2:30 Emergency Treatment of Burns: John P. Constable, M.D., Massachusetts General Hospital

2:45 Hearing Problems in General Practice: Frank D. Lathrop, M.D., Lahey Clinic

3:00 Treatment of Chronic Pain: Leroy D. Vandam, M.D., Peter Bent Brigham Hospital

3:15 Management of Intractable Angina: Edwin O. Wheeler, M.D., Massachusetts General Hospital

2:15- 3:40 Panel: Gynecologic Endocrinology

Moderator: Joseph Rogers, M.D., Pratt Diagnostic Clinic
Janet W. McArthur, M.D., Massachusetts General Hospital
Somers H. Sturgis, M.D., Peter Bent Brigham Hospital
Howard Ulfelder, M.D., Massachusetts General Hospital

4:00 U. S. Air Force Medical Service Mission in Space Medicine

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SEPTEMBER 27, 1963

OBITUARIES

Alfred L. Burgdorf, M.D.
1902 - 1962

Alfred Louis Burgdorf, M.D., was born in Meriden, Connecticut, May 8, 1902. He attended Concordia Institute, Bronxville, N.Y. where he taught Greek and German. Those who knew him well may not be surprised to learn that he first planned to go into the ministry and attended the Theological Seminary in St. Louis. Later he prepared for medicine at Columbia University and the University of Chicago and received his M.D. in 1931 from Rush Medical College. After an internship in Seattle, Washington and two years of practice in Alaska he spent a year of postgraduate study at the University of Jena, Germany.

Returning to Connecticut in 1935 he intended to enter private practice, but Dr. Stanley H. Osborn was successful in interesting him in a career in public health, thereby greatly enriching the practice of this medical specialty both in Connecticut and the nation through his leadership in the Hartford public health program.

I first worked with him in 1937 when he was an epidemiologist in the state department and I was in the department's new section on local health administration. He brought to the field of preventive medicine a most refreshing and stimulating point of view which made him most effective in raising community and state health standards. Realizing the value of postgraduate study, he went to Johns Hopkins for a year and received the M.P.H. in 1938.

Dr. Burgdorf became director of health for the City of Hartford in 1940 and had a joint appointment as director of health for the Town of West Hartford starting in 1961, thus achieving his dream for the start of a metropolitan health department that disregards political boundaries. His unusual teaching skill was recognized early in his career by Yale University, where he served as Lecturer in Public Health.

He has served as president of the Connecticut Division of the American Cancer Society and of the Connecticut Public Health Association, being awarded the latter's C.E.A. Winslow Award in 1960 as "one who has distinguished himself at the local, state and national levels." In 1962 the Mt. Sinai Hospital Association of Hartford presented him a distinguished service award for the highest kind of public service.

Always a persitent fighter for what he knew was scientifically desirable, Dr. Burgdorf succeeded in bringing about in Hartford an ordinance requiring pasteurization of milk, setting up a health clinic for city employees, achieving fluoridation of public water supplies for the greater Hartford area after a long struggle, and a teaching program in public health for student nurses at the University of Connecticut. During his illness in recent years I never once saw him despondent, but always with warm enthusiasm planning bigger tasks for the future.

Henry Drummond said, "There are some men and women in whose company we are always at our best." Dr. Martha Clifford noted that he had "some of the characteristics of Tom Sawyer, who so effectively had his friends whitewashing his own fence. But Dr. Burgdorf is different, in that he stays with the whitewashing of the fence, enjoying the process with his friends." He had unique ability to get widely different persons to work together for community betterment, who then found that tackling the difficult and new challenges of public health was both rewarding and fun.

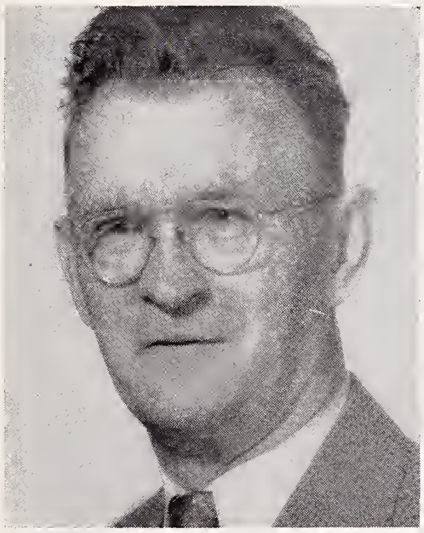
He died October 15, 1962 leaving his wife, Mrs. Ora Sullivan Burgdorf, whom he married in 1932; two sons, David Wharton Burgdorf and Alfred Marx Burgdorf.

Franklin M. Foote, m.d.

John J. Tokarczyk, M.D.
1890 - 1963

Dr. John J. Tokarczyk, of 32 North Street, New Britain, a practicing physician here since 1921, died suddenly in the yard of his home of a heart attack.

He was widely known here as the city's medical examiner, a post he held for about fourteen years, and for many years served the police department as the examining physician in driver sobriety tests.



Born in Poland, he attended the American International School in Springfield and Dartmouth College and was a graduate of the University of Vermont.

He interned at St. Mary's Hospital, Jersey City and Lying-in-Hospital, New York before coming here to begin a general practice in medicine.

He was a member of the Hartford County Medical Association, the New Britain Medical Society, and the Connecticut State Medical Society.

Despite a previous heart attack suffered some ten years ago and other personal and family misfortunes, Dr. "Toky," as he was known to his friends and colleagues, carried on in the best traditions of the profession, working conscientiously, though in a restricted manner, up until the very moment of his death.

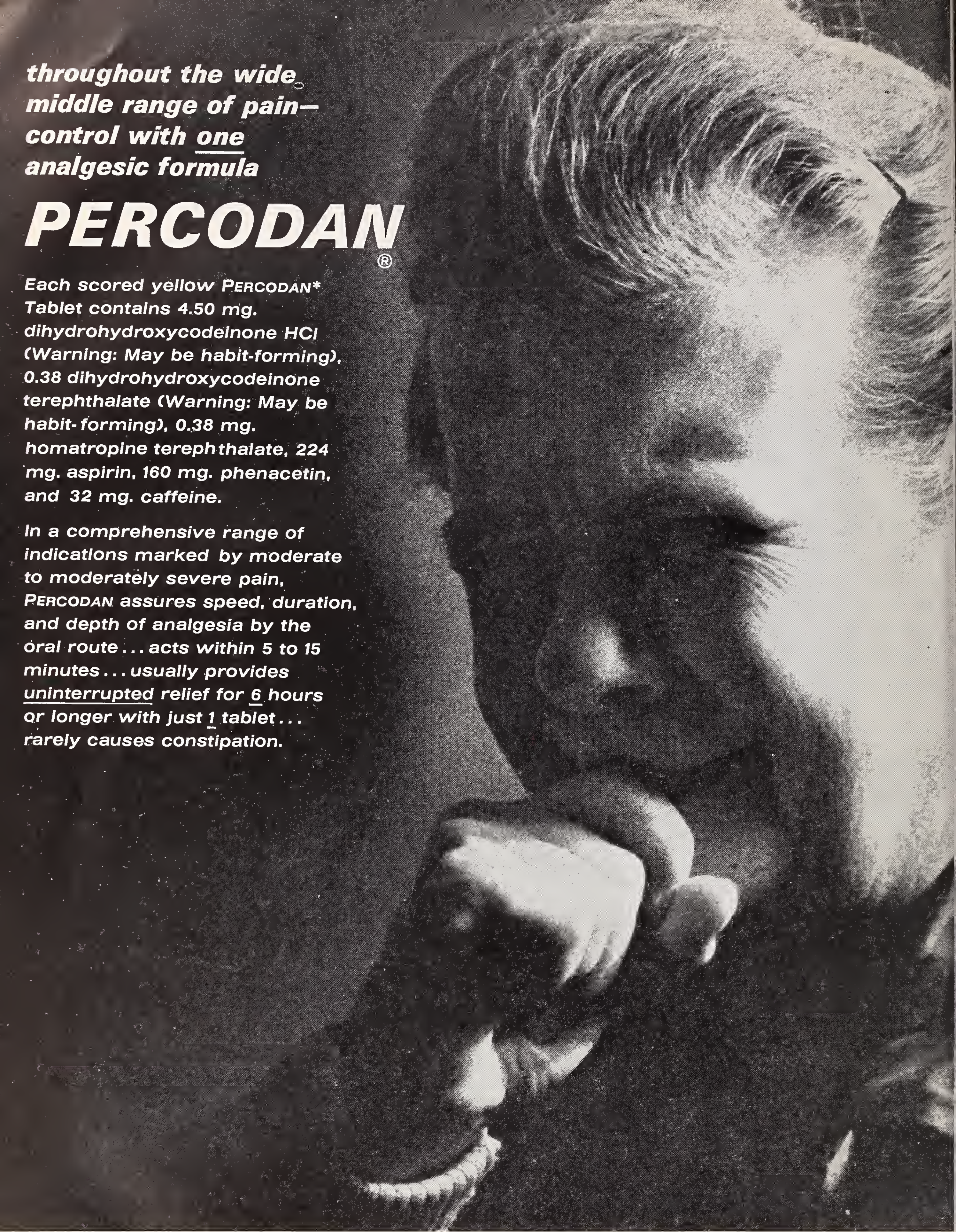
He will be missed by his patients as a devoted practitioner and by his colleagues as a loyal friend.

Ludmil Chotkowski, m.d.

In Memoriam

Phillips, Frank L.—New Haven; Yale Medical School, 1906. Dr. Phillips was a retired head of the ear, nose and throat division of the Department of University Health at Yale. One of the founders of the department, Dr. Phillips retired in June 1953, after service at Yale for 32 years. He maintained a practice in New Haven for more than 50 years, retiring in August, 1962, because of his illness. Dr. Phillips was an associate professor of otolarynology at the Yale Medical School and consultant at Grace-New Haven Community Hospital. He was on the staff of Grace-New Haven Hospital and St. Raphael's Hospital. Dr. Phillips was a member of the New Haven County Medical Association, the Connecticut State Medical Society, the American Medical Association, the American Laryngological, Thinological and Otological Association, the American Board of Otolaryngology, Wooster Lodge 79, AF and AM, and many Masonic organizations. Dr. Phillips died May 10 at the age of 83.

Watts, Joseph F. — Bridgeport; Georgetown Medical School, 1912. Dr. Watts was a retired eye specialist and had practiced in the Bridgeport area for 46 years. He was an opthalmology consultant at St. Vincent's Hospital at the time of his death. He also served on the surgical staff of Grace-New Haven Community Hospital and the courtesy staff of Bridgeport Hospital. Having undertaken graduate studies in the Yale University Opthalmology Department, Dr. Watts was assistant professor in clinical opthalmology there 25 years. During World War I, Dr. Watts was an opthalmology section chief in Walter Reed Army Hospital, Washington, D.C. During World War II, he was medical projects chairman of the Bridgeport Russian Relief Association. Dr. Watts was a member of the American Board of Otphalmology, the Connecticut State Medical Society, the Fairfield County Medical Association, the Royal Vilas Assembly of American Magicians, the Bridgeport Lions Club, and the Easton Ambulance Association. In his earlier days, Dr. Watts was active in sports. He served as a referee in Ivy League football games. Dr. Watts celebrated a half century in the medical field with the receipt of a golden citation from Georgetown University last June, commemorating the 50th anniversary of his graduation there. Dr. Watts died May 29, at the age of 72.



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BOOKS RECEIVED

Books received for review are acknowledged in this department and such acknowledgement must be regarded as a sufficient return for the courtesy of the sender. Selection will be made for review in the interests of our readers and as space permits.

Counseling in Medical Genetics. 2nd Edition, by Sheldon C. Reed, Ph.D., W. B. Saunders Co., Philadelphia, Pa., 1963, 278 pp. $5.50.

Modern Clinical Psychiatry. Sixth Edition, by Arthur P. Noyes, M.D., and Lawrence C. Kolb, M.D., W. B. Saunders Co., Philadelphia, Pennsylvania, 1963, 586 pp. $8.00.

Bilharziasis by Ciba Foundation Symposium, G. E. W. Wolstenholme and Maeve O'Conner, Little, Brown and Co., Boston, Mass., 1962, 433 pp. $11.50.

Intestinal Biopsy. By Ciba Foundation Study Group No. 14, in honour of Professor C. Jimenez Diaz, Edited by G. E. W. Wolstenholme and Margaret P. Cameron, Little, Brown and Co., Boston, Mass., 120 pp. $2.95.

Clinical Metabolism of Body Water and Electrolytes. By John H. Bland, M.D., W. B. Saunders Co., Philadelphia, Pa., 1963, 623 pp. $16.50.

New and Nonofficial Drugs, 1963. Evaluated by A.M.A. Council on Drugs, J. B. Lippincott Co., Philadelphia and Montreal, 902 pp.

Medicine and the State. By Matthew J. Lynch, M.D., and Stanley S. Raphael, M.B., Charles C. Thomas, Springfield, Illinois, 1963, 449 pp. $9.75.

Samuel Seabury Priest and Physician Bishop of Connecticut. By Herbert Thoms, M.D., The Shoestring Press, Inc., Archon Books, Hamden, Conn., 1963, 166 pp. $4.95.

Cardiovascular Surgery. 1962, Proceedings of the Council Cardiovascular Surgery, American Heart Association, Monograph No. 6, Edited by John M. Howard, American Heart Association, New York, 1963. $3.00.

The Practice of Country Radiology. By Donald de Forest Bauer, M.D., Charles C. Thomas Publisher, Springfield, Illinois, 1963, 257 pp. $11.75.

Margin of Safety. By John Rowan Wilson, Doubleday & Co., Inc., New York, 1963, 258 pp. $4.95.

Management of Anxiety for the General Practitioner. By Nathan K. Rickles, M.D., Charles C. Thomas, Publisher, Springfield, Illinois, 1963, 108 pp. $5.00.

Infectious Diseases. Volume 11, Editor in Chief, Colonel John Boyd Coates, Jr., MC., USA, Editor for Internal Medicine, W. Paul Havens, Jr., M.D. Office of the Surgeon General, Department of the Army, Washington, D.C. 1963, 649 pp.

The Story of Blood. By Kenneth Walker, Philosophical Library, Inc., New York, 1963, 213 pp. $10.00.

The Pediatric Patient 1963 by David Baird Coursin, M.D., and Sarah R. Gustafson, Ph.D., Roche Laboratories, Nutley, N.J. 1963, 183 pp. $4.95.

Doctor's Office

Felix J. Callan, M.D., announces the opening of an office in association with William Sinton, M.D., and Robert Fornshell, M.D., for the practice of orthopedic surgery at 85 Osborne Street, Danbury.

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NEW BOOKS IN REVIEW

PHYSICAL DIAGNOSIS by Ralph H. Major, M.D. and Mahlon H. Delp, M.D. W. B. Saunders Co., Philadelphia, Pennsylvania, 1962, 355 pp., $7.50.

REVIEWED BY LOUIS H. NAHUM

Physical diagnosis is a very old medical art. One has but to read the recorded findings of Hippocrates in forty-two clinical cases to see that the master clinician and diagnostician took a complete personal and family history and then examined his patients with meticulous care employing not only inspection, but also percussion and even auscultation to a limited extent. Formerly, correctness or errors of diagnosis could be demonstrated only by the autopsy. Today we can study the accuracy of our result in percussion on the living man and under natural conditions. It is certainly a great blessing to the physician that Roentgen plates and records from instruments of precision like the electrocardiogram can show up the errors of an over refined technique of former times and the "under refined" technique of percussion and auscultation that students today are often accused of, because of relying too much on the laboratory and too little upon their own efforts. No rewards are surer in medicine than those that come to the doctor with a practical eye, ear and finger.

As Osler said, "physical diagnosis is to be learned only by experience 'tis not an inheritance, it cannot be revealed. Learn to see, learn to feel, learn to smell and know that by practice alone can you become an expert. As is true with learning any complicated discipline in physical diagnosis, a true start is most important and a false start may be disastrous. The approach to its learning is also important. First of all is the basic precept that must always be kept in mind that physical signs are produced by physical causes and it is the underlying physical causes that must be understood before the physical signs can properly be appreciated. Then there is the important question of the logical order in which examination of a patient should proceed. The authors admonish their students to look long before palpating, palpate long before percussing and percuss long before listening. There are no short cuts in physical diagnosis. It is learned only by practice. Not a dull dreary monotonous practice, but practice with all the senses alert and "tuned in." If one slides over these details, one will fail for as Pasteur has pointed out "in the field of observation chance favors only the prepared mind."

The book is more than a perfect textbook of physical diagnosis. There is historical scholarship in it. The development of palpation, percussion and auscultation is excellently portrayed in the introduction. Throughout the book the authors have made free use of quotations not only because of their great interest in medical history but also because of the excellence of many early accounts. They have also used illustrations used by pioneers in certain fields of investigation such as Biot's respiration and Traube's original curve of pulsus alternans which is of more interest than any of the thousands of curves which have been made since. Unless one goes to the original sources, one finds too great a variance in different books in their description of Traube's semilunar space, Skoda's resonance and many other physical findings. Another merit of this book is that the authors have drawn freely from previous excellent texts of many writers such as Cabot, Rose and Elmer Emerson, Norris and Landis, Pratt and Bushnell, Seifert and Müller, Edens and Letulle, and the wonderful textbook by Hirshfelder.

In the fifteen chapters and an excellent index physical diagnosis of all parts of the body are covered, including the nervous system. An excellent chapter on pain included. Although pain is a symptom, it is an important part of all physical diagnosis, and its character, location and radiation is a valuable part of diagnosis.

There is no doubt the authors have succeeded in their intention. They have produced a textbook that is and will remain a classic in its field. They have succeeded in indicating the paths of exploration a student should follow in successful examination of a patient. They have synthesized an extensive experience, derived from teaching medical students, with the best in other works and they have added a priceless ingredient, scholarship love of medical history and evolution of medical concepts in physical diagnosis. Careful adherence to its teaching and precepts will make examination of a patient an intellectual pleasure and a most successful and rewarding activity.

SURGERY IN WORLD WAR II, Editor-in-Chief, Colonel John B. Coates, Jr., M.C., U.S.A. THORACIC SURGERY VOLUME I. Published by U. S. Government Printing Office, 394 pp., $4.25.

Reviewed by: DENIS S. O'CONNOR

This is one of the slimmer volumes of the History of Surgery in World War II but it is by far the most fascinating reading of the volumes printed so far.

Because of necessity, tables of statistics constitute an important part of any activity involving large numbers of individuals and what happens to them. Most volumes of historical material are for study and reference rather than stimulating reading.

This volume on thoracic surgery has a minimum of statistics because it is largely the story of a fledgling specialty of surgery suddenly developing into the mature specialty of thoracic surgery. Furthermore, it is the story of our appreciation of the thoracic physiology on which thoracic surgery is based and on the contributions of modern anesthesia to both thoracic physiology and surgery.

As time goes on and one looks back into the origins of thoracic surgery, the name of A. Tudor Edwards of England may well occupy the place in thoracic surgery that the name of Harvey Cushing occupies in neurological surgery, and the horrible experience of the bombing raids over England may constitute the "labor pains" of modern thoracic surgery. For it was out of the study of the chest casualties of those raids that British medicine developed the principles which were later to guide our surgeons in their tremendously successful treatment of chest injuries.

At the beginning of World War II there were few thoracic surgeons which was a matter of great concern to those surgeons who were planning the surgical coverage in the theatres

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of operation. One of the plans which can be regarded as a stroke of genius was the organization of surgical teams strategically placed to augment the various hospital staffs during periods of stress. Probably no special surgical team filled a greater need than the thoracic surgical team.

The basic physiological principles of respiration which formed the basis for successful surgical treatment of chest wounds was not too well understood by otherwise competent surgeons and surgical skill without understanding was not enough. While the special thoracic surgical teams were able to bring the greatest specialized skill to the injured, their presence in the hospital, the demonstration of the physiological principles on which their work was based and the dramatic results of their work was a revelation to otherwise highly trained and competent surgeons and a source of inspiration to the younger and still uncommitted surgeons. It is little wonder that the general surgeons developed ability to do creditable chest surgery and that younger men saw a new specialty opening to them.

While the credit for the organization that made thoracic surgery so successful in spite of the lack of fully trained thoracic surgeons, belongs to many individuals, the late Dr. Eliot Cutler and Dr. Dwight Harken played a significant role.

The reviewer could continue at great length on the many valuable facets of this thoracic surgical volume but only the reading of it can do justice to it.

For anyone who enjoys history, and especially medical history, this volume can give great pleasure. For the medical man, whether he be internist or surgeon, specialist or generalist, this volume would be a valuable addition to his library. For the emergency room surgeon the knowledge derived from this volume could mean the saving of lives.

The second volume on thoracic surgery is looked forward to with high interest but it is doubtful if it can have the sustained interest of this volume.

PRIMER OF CLINICAL MEASUREMENT OF BLOOD PRESSURE by George E. Burch, M.D. and Nicholas P. DePasquale, M.D., C .V. Mosby Co., St. Louis, Missouri, 1962, 141 pp., $5.50.

Reviewed by: LOUIS H. NAHUM

No patient is adequately examined unless his blood pressure is properly recorded. Nevertheless, arterial pressure is fickle and the ill-informed and unprepared physician is readily confused and his patient might be erronious treated. This is especially true and in fact frequent in hospital practice where blood pressure recordings are made by nurses.

Accuracy is possible only when the principles and techniques of recording blood pressure are completely understood. There are many pitfalls all thoroughly considered in Chapter 4 of this classic monograph. There is the error from improper positioning of the extremity, of deflating the cuff too rapidly or too slowly, of recording the first blood pressure, of failure to have the mercury column vertical, of the auscultatory gap, of improper application of the compression cuff. Then there are errors which arise from failure to consider the patient adequately, such as psychologic factors, meals, tobacco, bladder distention exertion, pain due to inflation of the cuff.

The book begins with an excellent chapter on the history of the recording of blood pressure. Then a chapter on physiology of arterial pressure, one on clinical measurements of arterial pressure, factors that affect the arterial blood pressure, normal values of arterial blood pressure and diagnostic applications of arterial pressure measurements. The book ends with a fine bibliography. Only one reference of importance is missing that of the Russian sugeon Korotkoff who in 1905 described sounds heard over an artery immediately below the cuff and which are known as Korotkoff sounds.

This excellent monograph will stimulate thought, it will help rectify errors in measurement and interpretation it will instill confidence, engender humility and respect for the problems involved in the clinical recording of arterial blood pressure. If proper habits, proper equipment and proper techniques are used routinely, it will be found that it is just as easy to record blood pressure accurately and reliably as it is to record it haphazardly and erroneously.

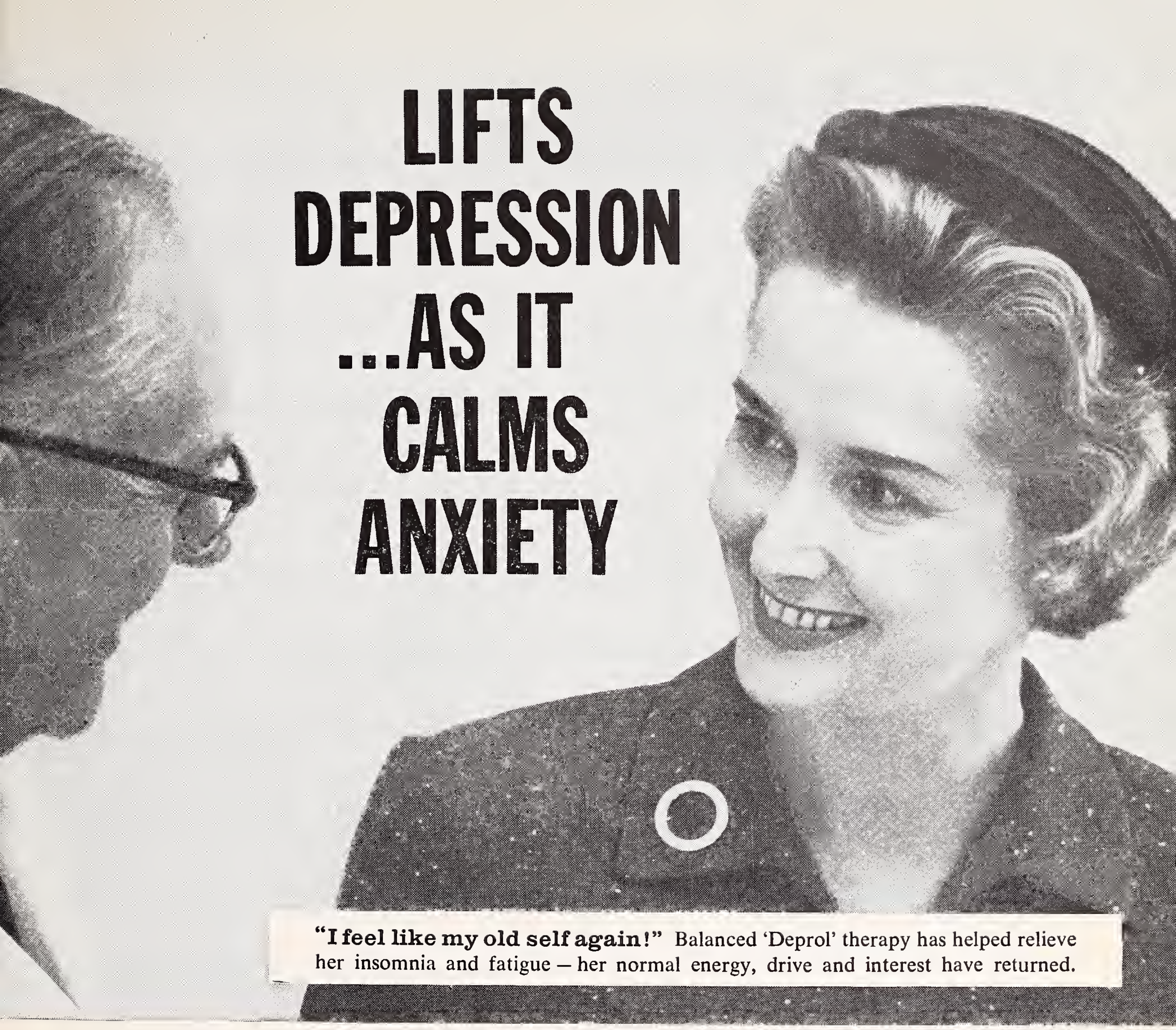
GYNECOLOGY: A STUDY BY AGE GROUPS OF THE DEVELOPMENTAL FUNCTIONAL AND PATHOLOGIC ASPECTS OF THE FEMALE REPRODUCTIVE SYSTEM AND ITS DISORDERS by Langdon Parsons, M.D., and Sheldon C. Sommers, M.D., W. B. Saunders Co., Philadelphia and London, 1962, 1250 pp., $20.00.

Reviewed by: LOUIS H. NAHUM

During the past 150 years numerous books, monographs and reference works have been written on various aspects of gynecology. Primarily they have been written either for the medical student, or the general practitioner, the pathologist or the gynecologic specialist. This book however, is unique because it was born of a new idea. It is written by a clinician, Dr. Parsons and an excellent general pathologist, Dr. Sommers. Out of their collaboration have come a new organization which may have been borrowed from Shakespeare's concept of the seven ages of man, for they have described beautifully and completely the gynecologic problems encountered during the seven ages of women. The subdivision of the book into seven parts allows each subdivision to correspond precisely or generally with the seven decades in the life of the female. This grouping is also biologically sound because there is natural predominance of specific problems during well defind periods of growth, development, maturation, maturity, senescence and senility.

In practice the clinician learns to correlate almost reflexly the main problems with the age group in which the problem occurs. This text then will enable him to arrive at this state of clinical maturity earlier and more easily. Integration of this type is necessary both to the teaching as well as the learning process. This book will make it easier and more pleasant for the medical student and general practitioner to see the whole field of gynecology from birth to old age. They will learn more quickly, understand more quickly and remember longer the essential problems in this broad important field of medicine.

Both authors are experienced writers and in this book have produced lucid flowing prose that is pleasant to read. It reveals an extensive experience and wide reading in the broad fields of gynecology and its pathology. Its structure



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is also unique in its teaching aspects in which the Socratic method is employed throughout. Each point is introduced by a question such as what effects do hormones have on skeletal growth and development? Or what are the common pitfalls in the problems of sex rearing? What can be accomplished by conversation with the patient? What is the clinical course of most uterine sarcomas? How is the differential diagnosis of stress incontinence established and hundreds of others.

Each chapter is followed by many important references which attest to the scholarship of the authors. At the end of the book is a voluminous index of fifty-three pages. The numerous figures are clear and educational.

This reviewer fully endorses a statement by Dr. Joe Meigs in the forward "as a gynecologist and as one interested in the problems he and Dr. Sommers have elucidated, I can recommend this book highly and can advise any one who is a doctor of medicine to read and use it for it is one of the great books of recent years."

DRUG THERAPY by Frank C. Ferguson, Jr., Lea Febiger, Philadelphia, Pennsylvania, 1962, paperback 411 pages, $7.50.

Reviewed by: LOUIS H. NAHUM

This is a book for everyone practicing medicine, be he a general practitioner, a specialist in any field of practice, an intern, resident or an advanced student. It tells what drugs to use, the dosage, when to institute treatment and why, and cautions on contraindications and toxicity.

The author who is professor of pharmacology at Albany Medical College of Union University, Schenectady, is eminently fitted for the task he undertook, namely to choose the best compounds for use, to give pharmacologic and clinical data needed for the proper use of the agent. He has drawn upon his expert knowledge of clinical pharmacology and upon the practical expereince from use of the drugs in the Albany Medical Center Hospital. The result is a list of most efficacious, least toxic and least expensive componds, in a variety sufficient to encompass all therapeutic needs.

The data presented provide a background knowledge on the working of drugs and the practical details of clinical applications. Most chapters begin with general notes in which under the heading of pharmacology are described the features of activity, toxicity, and metabolism characteristics of the group. Then under "choice of drugs" are listed the points in which agents differ and the choice of individual compounds for particular uses. Finally under "clinical usage" are described indications for use, principles of dosage and limitations of therapy.

Several things have been purposely excluded; the relation of chemical structure to activty, basic in pharmacology but of no clincal significance; historical matters, debatable theories, not important in practical use of drugs. References are not given because the author emphasizes that this book though based on knowledge, experience and wisdom is after all given over to the choice of drugs which must in the end be a matter of opinion. The reader, however, will be grateful for the author's opinions, which are sound, wise and authoritative.

The book is small enough so that it can be carried in a pocket or the bag.

PULMONARY STRUCTURE AND FUNCTION by A. S. V. deRenck and Maeve O'Connor, Editors, Little Brown & Co., Boston, Massachusetts, 1962, 403 pp., $11.50.

Reviewed by: LOUIS H. NAHUM

Ciba is a distinguished foundation which is rendering service to medical research and this symposium is no exception. It is especially timely because none has been held on this subject thus far. The idea of collecting less than 30 outstanding scientists from all parts of the world to present this methodology and results and to engage in an intimate discussion afterwards is an excellent one, and best calculated to bring any subject into focus and clarify the problems that remain for investigation.

In health 750 million alveoli 1/10th of a mm are evenly ventilated in health. What happens to them in disease? As the symposium progressed it became clear that now we can assess degrees of damage in various lung segments. Continuous physical methods of recording changes in gas concentration are opening up new approaches and accelerating enormously the speed at which we can carry on our functional studies. Hugh-Jones mass spechometer gives a written record of the continuously changing concentration of gases just as quickly as one can make the expiration. But the recordings are still of averages of a whole population of alveoli disrupted and disordered in varying degree, all behaving differently.

The central problem is to identify more precisely the structural foundation of lung disease and the resultant change in bodily function. Dr. Averill Liebow of Yale described pulmonary structure, interesting changes in the bronchi, in the muscles, in the alveoli and in the pulmonary and bronchial circulation. Campbell described the proprioceptive mechanisms of respiration especially during "loading." Krahl described a new structure the pulmonary glomus, as yet without a function. Hayek described lung secretions with respect to their surface tension forces which shape the dimensions of the inner structures of the lungs. Comroe talked about the surface tension in a section with a blocked circulation.

Rahn studied the physiologic consequences of uneven distribution of ventilation and perfusion in the lung. Hugh-Jones was able to localize the uneven and obnormal function. Forster studied rate of uptake of respiratory gases while Loosli showed fine structure of alveoli and their embryologic development. Riley studied vascular resistance in relation to lung expansion. DuBois studied the dynamics of pulmonary blood flow.

It became clear that we still need better methods, more geometry, more physics, more chemistry to define the capillaries and their structure. Also much discussion took place on what is emphysema without a definite answer. It also became clear that to study the lung as near to the living as possible we need new methods, very gentle ones or else very quick ones to prevent distortion either structural or physiological. Apparently we do not know early stages of the process when we examine total massive and locally varied damage.

The book will be of great importance to pulmonary physiologists and chest clinicians who are searching for a clearer insight into the disturbances, the symptoms they produce and what must be done about them.

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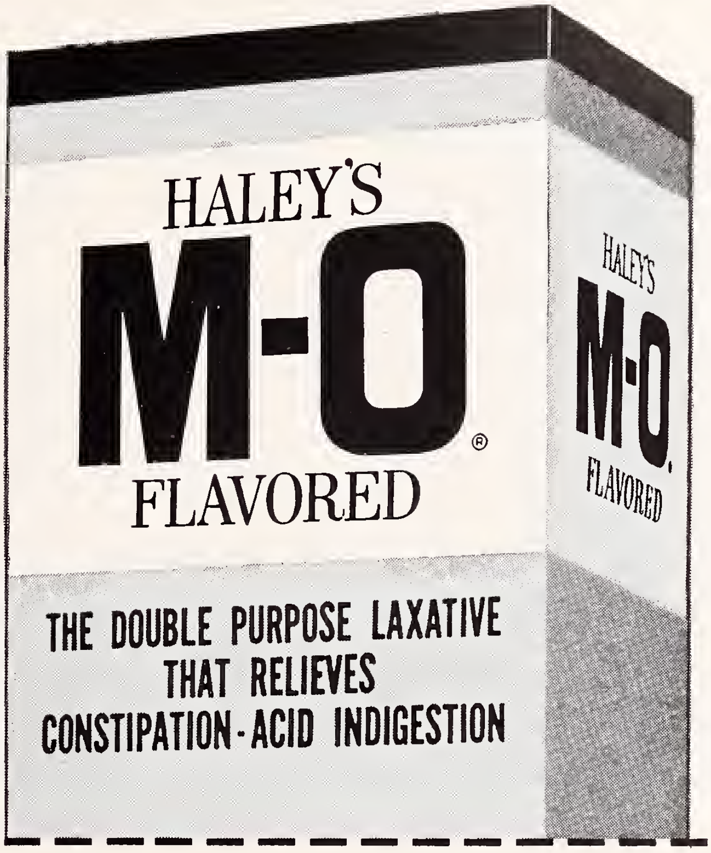

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SHOCK, PATHOGENESIS AND THERAPY, An International Symposium Edited by K. D. Bock, Springer-Verlag, Berlin. Gottingen. Heidelberg, 1962, 387 pp.

Reviewed by: LOUIS H. NAHUM

The chairman of this symposium held in Stockholm June 27-30, 1961 was U. S. von Euler who gave the opening remarks and these were followed by papers and discussion by forty-one scientists from many lands. The various areas of agreement and disagreement came out clearly in the discussion where improved theories were separated from accepted belief.

What came out of the Symposium was the extreme importance of differentiating between reversible and irreversible shock, because what happens during each of these phases is an important contribution to our thinking and therapy. For there are careful measurements of what happens in the cardiovascular system, and by many techniques it was shown possible to analyze these events, so as to give us a better understanding of shock.

In the past the nervous sytsem has been somewhat neglected and Dr. Neil presented some new ideas and concepts on this very important aspect. He pointed out that more is needed to understand how the nervous system initiates and promotes the development of shock especially the sympathetic outflow.

Endocrine factors were discussed in certain contexts and it is clear this is an area that needs to be further explored. The role played by the kidney was made obvious by the important contributions of several workers Kramer, Selkurt, Bing and Howard. Blood volume, blood aggregation and blood viscosity were well covered. The biochemical events and the development of acidosis were well studied but more needs to be known.

Endotoxins and other toxic products are certainly of the utmost significance and papers on mechanism of action of endotoxins were of great interest. Allergy and irradiation were touched upon but much remains to be done.

From the therapeutic point of view convincing proof of the importance of preventing irreversible shock especially by the use of drugs that prevent sympathetic overactivity which acts much like an internal tourniquet and is highly undesirable was offered. The value of Dibenzylene in this regard was especially revealing although we must not forget that conventional pressor drugs are indicated in certain stages. In the falling blood pressure, raising it is necessary to restore flow.

There are many factors encountered in any study of shock. The situation is extremely complex and more data will be needed and should be obtained by means of well planned experiments. The medical man, surgeon, anesthetist and even students will gain much from a study of the papers and discussion in this book.

COMPARATIVE NEUROPATHOLOGY by J. R. M. Innes and L. Z. Saunders, Academic Press, Inc., New York, 1962, 839 pp., $32.00.

Reviewed by: LOUIS H. NAHUM

This magnificent book is a combination atlas, text and reference book. It covers neurologic disease in animals all over the world and has a large international bibliography of four thousand references. There are approximately six hundred selected illustrations of beautifully reproduced photograps including two color plates. The format is large and was so chosen to permit the reproduction of the photographs in complete detail. Many full page plates are included. All aspects of cerebrospinal fluid examination are discussed comprehensively. In many places the authors have drawn analogies between animal and human neuropathology.

The book is an outgrowth of a review written for Advances in Veterinary Science in 1957. It is addressed chiefly to the veterinary pathologist and graduate veterinarian interested in diseases of the central nervous system of animals. But it will handsomely serve the needs of workers in human medicine also who are interested in animal diseases from comparative points of view or because they use animals for experimentation. With this book neuropathology becomes a science in its own right, as is acknowledged by scientists all over the world who sent material to the authors for study and advice much of which forms the basis of this book.

The authors are more interested in neuropathology as an intellectully challenging science than merely in its ability to solve pressing practical problems. Accordingly one finds a broader view, one which includes human pathology also. They have provided a long-sighted comparative view which can be of great value to the medical pathologist especially one who is involved in experimental fields.

The book is divided into twenty-five chapters devoted to every aspect of diseases of the nervous system by whatever cause. Inflammations by viral or bacterial agents or toxic substances or infestations, neoplastic diseases, vascular and degenerative and deficiency diseases. There is even a chapter (XIX) on pigmentations and depositions.

Hughlings Jackson said "The study of things caused, must precede the study of the cause of things." This book, however, admirably portrays the effects from causes known and unknown. There is no doubt that the book fulfills completely its main purpose—to provide in the English language a comprehensive text for veterinary pathologists in particular and for all those who must use animals for experimental study in any way connected with the nervous system. It is a classic that will endure for a long time.

Tests For MDs

Physicians attending the AMA Annual Meeting in Atlantic City were offered a series of screening examinations and clinical pathology tests as a part of the Scientific Exhibit.

In a similar series of pathology tests at the 1962 Annual Meeting, abnormalities were found in more than two-thirds of the physicians tested. A total of 2,212 abnormal findings were reported in 1,771 MDs tested.

Connecticut Medicine

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ENVIRONMENTAL MEDICINE: LEONARD GREENBURG, M.D., GUEST EDITOR

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The Liberty Amendment

At the June meeting of the AMA in Atlantic City, nearly an hour of an afternoon session of the Reference Committee on Legislation and Public Relations was spent in hearing testimony on the so-called "Liberty Amendment." Later, the House of Delegates accepted a recommendation of the Reference Committee that: "... the Amendment (be called) to the personal attention and consideration of individual physician citizens."

The "Liberty Amendment" is, at the moment, a philosophic concept being publicized on a national scale by a number of responsible agencies which favor constitutional government. If and when it should be formally introduced in Congress as a proposal to amend the Constitution, its enactment, would call for ratification by at least three-fourths of the fifty states.

Directed against the continuing encroachment of the Federal government into the private sector of the economy, and the unbridled use of the taxpayer's money to allow government operations to compete with him unfairly in the business arena, the "Liberty Amendment" proposes the following:

1. That the Federal Government be put out of all activities except those specified in the Constitution.
2. That the Government be kept from reentering such activities through later laws, agreements, edicts or treaties.
3. That Government-in-business assets, properties and facilities be liquidated within three years, and
4. That, at the end of three years, Federal personal income tax laws be repealed (probably on a graduated scale).

The usual question which the neophyte in these matters is prone to ask is: "How could the Government operate if the income tax were to be abolished?" Yet if one stops to consider that personal income taxes is only one of many sources of the Government's total revenue from taxation, and that billions upon billions of dollars would be saved if Federally-operated businesses were abolished and their assets liquidated, one might perhaps conclude that the proposal is not so far fetched as it might seem at first glance. As a doctor from Texas said at the hearing, when someone expressed doubt as to the actual soundness of the "Liberty Amendment:" "So we may prove to be off a few billion dollars in our calculations—what of it? The Administration is never bothered by such trivial mistakes in *its* budgeting, so why should we worry?"

As an "individual physician citizen," why not give the matter a little personal thought and contemplative study.

THE COVER

DR. SIMEON SMITH HOUSE

Sharon

In this house on February 1780 the First Medical Society in the Thirteen States of America since their Independence held a convention at the invitation of Dr. Simeon Smith of Sharon. A prominent topic of discussion then was the desirability of establishing a medical school in Connecticut. This was also the occasion for an oration by Dr. James Potter of Fairfield, well known for his speech making powers.

Dr. Simeon Smith who built this house, now known as Weatherstone, was a highly successful practicing physician and also at different times a soldier, a legislator, a wholesale and retail merchant and a dealer in real estate. He was born in Suffield about 1735, received some of his education abroad and came to practice in Sharon about 1759. Soon after this he established a drug store and an import business supplying smaller dealers in other towns including New Haven and Hartford. In 1776 he was a captain of company of Sharon men equipped largely at his own expense and which served in the Long Island campaign. Later he raised and partially equipped another company of volunteers to resist the advance of Burgoyne.

Dr. Smith had a life long interest in the establishment of a State medical school and in 1804 just before his death he wrote, "I have now leisure to devote to my favorite project,—the establishment in my native State of as fine a Medical College and Hospital connected therewith as may be found in any country, I am not yet seventy, my health is good. I hope to see it started."

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Antihistamines — Rhulihist and many other topical preparations containing antihistamines are offered for itching dermatoses despite the limited effectiveness and the relatively high incidence of allergic skin reactions to such drugs. In a poll of leading dermatologists (JAMA, 153:1447, 1953), there was general agreement that the risk of allergic skin reactions from topical antihistamine drugs overshadowed their possible usefulness as local anesthetic or antipruritic agents. A similar high incidence of sensitivity to topical skin preparations containing sulfonamides and penicillin led to their rejection by most physicians about 15 years ago, and topical antihistamines merit the same fate.

Desensitization to Poison Ivy—Plant extracts are used both orally and parenterally for desensitizing patients against poison ivy (or poison oak or sumac —the same sensitizing materials are present in the plant juices of all three). If patients are to be believed, these extracts are highly effective; patients have, however, reported themselves immune to poison ivy after placebos, when quantitative patch tests—the only objective method of measuring sensitivity—showed no change (A. M. Kligman, Arch. Derm., 78:47, 1958).

Many companies offer plant extracts for desensitization, but some of the manufacturers are more skeptical about them than are many physicians. One manufacturer, replying to an inquiry of The Medical Letter, explained with refreshing candor that "We carry the extract in our line as a 'service' item for physicians who believe the product has prophylactic value for some patients. We no longer advertise or actively promote it."

Attempts to densensitize are tedious and the reduction in sensitivity, at best, is not likely to be great. Oral extracts are at least relatively safe, and some Medical Letter consultants have had modest success with them, as measured by quantitative patch tests, giving gradually increasing doses over a period of many months. Because of the limited effectiveness, inconvenience and high cost of such treatment, it is probably worthwhile only in highly sensitive persons who cannot avoid exposure.

Reprinted from The Medical Letter on Drugs and Therapeutics, New York, N.Y., Vol. 5, No. 11, May 24, 1963.

Around The State

Birth Defects Special Treatment

An official directory of the 60 birth defects and arthritis treatment and study centers financed by The National Foundation-March of Dimes and its local chapters is now available to physicians and others in related professions

The Center located in Connecticut is the Birth Defects Special Treatment Center at the Grace-New Haven Community Hospital, New Haven. Nationally there are centers in 32 states and the District of Columbia.

Detailed information is given concerning each center's staff, categories of cases that can be treated, scope of care available, coordinated research and teaching activities, methods of admission and methods of referral.

Purpose of the directory, according to Dr. William S. Clark, director of The National Foundation's medical department, is to acquaint the medical and allied professions with the purposes and scope of the exemplary care program sponsored by the Foundation.

The directory consists of a brief explanation of the medical program objectives and a description of the work of each center listed alphabetically by state.

Copies of the directory may be obtained by writing:

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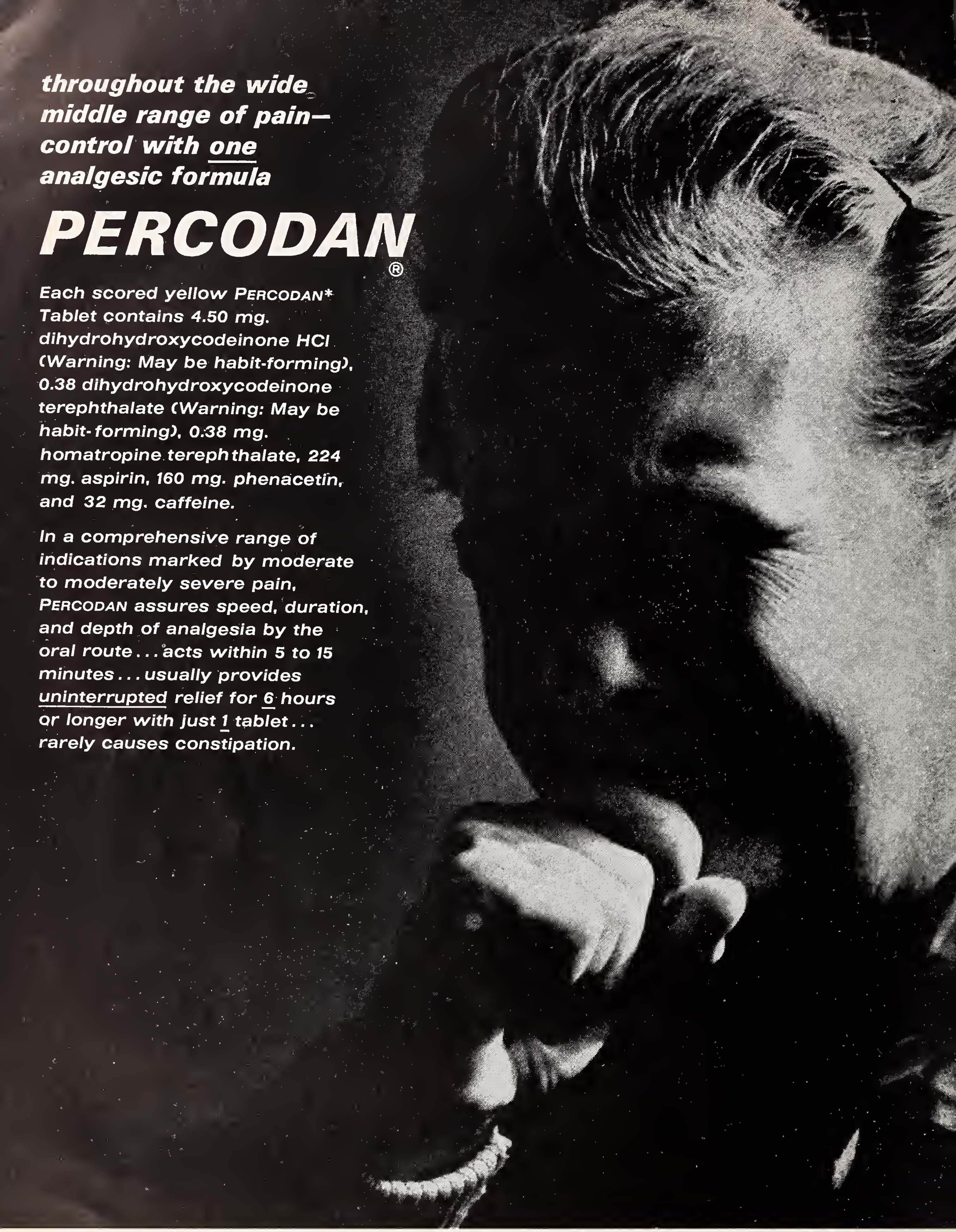
Chest Physicians Certificates

Eight Connecticut physicians received Certificates of Fellowship in the American College of Chest Physicians during convocation ceremonies recently at the 29th Annual Meeting of the College in Atlantic City.

They are Doctors Richard H. Greenspan, New Haven; James B. D. Mark, New Haven; Saul M. Greenstein, Newington; James J. Griffith, Norwalk; Sreedhar Nair, Norwalk; Robert G. Nims, West Haven; Carl S. Hellijas, Wethersfield and Harold Stern of Woodbridge.

The college is an international society with nearly 8,000 members in 89 countries and territories throughout the world. Mr. Murray Kornfeld, Chicago, is Executive Director.



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CONNECTICUT MEDICINE / *editorials*

Air Pollution—A Growing American Problem

The population of the United States is increasing at a very rapid rate. As the number of persons in our country increases, the requirements of the population increase proportionately. This brings about the need for more industry in order to produce the required products and this in turn, demands greater power production on the part of the electrical utility companies. In turn, more transport of personnel and material is required. This necessitates an increase in the use of automobiles and trucks for transportation. Additional streets and roads are required. In some areas, three, four, and even five layers of such highways can be seen at certain intersections. We are outgrowing many of our facilities. We need more buildings, and the changes which have been taking place in building construction in many cities of the United States bear witness to the fact that we need more buildings in order to house more persons, business offices and industries.

We are beginning to outgrow our water supplies. At the moment in certain areas of the U.S. there is deep concern about the provision of adequate amounts of water for the use of homes, offices and industry. There is ample evidence that we are beginning to outgrow the ability of our atmosphere to dilute the pollutants which are poured into it from a great many sources, homes, factories, industrial establishments, incinerators, motor vehicles, and other sources of pollution. There is a growing body of evidence to support the view that health is related to the purity of the atmosphere in which we live, and it is for this reason that the problem of air pollution is of concern to the physician.

This issue of the "Journal" presents five contributions on the effects of environmental exposures on plant, animal, and human life. They have been written by five leaders in the field. It is the hope of the editor that these five papers will serve to provide the medical profession with a fundamental picture of the problem of personal and community-wide air pollution on the health of man, animals and plants, and that an informed medical profession will by this means be able to take a deeper and more sophisticated interest in this area of human health and disease.

Leonard Greenburg, M.D., *Guest Editor.*
Professor and Chairman,
Department of Preventive and Environmental Medicine,
Albert Einstein College of Medicine,
New York, New York

Death In The Sky

Any one driving past a sandy redevelopment in New Haven harbor is confronted on a windy day with tons of air borne sand which he must breathe, which gets into his lungs, his eyes, his clothes, and his hair. The beauty of the landscape is lost in a yellow gritty cloud. Somehow the average citizen passively accepts such a man-made attack upon his comfort and his heath without complaint, thinking it is an act of God about which nothing can be done. On further reflection however, we come to realize that we in the cities dwell in the midst of dirty air, air that undermines our health and shortens our lives, that grimes our buildings, that seeps into our rooms, that impairs the beauty of sky and earth, air that we ourselves have dirtied.

There is hardly a city of any size that does not suffer from industrial "fallout," and at times an irritating haze. It has been estimated that 100 million people in this continent are now seriously affected by air pollution.[1] The countryside also suffers from farmers burning brush and grass during the dry season, and as they plow up the land, the soil takes flight in the slightest breeze. Whether in city or country it seems as if almost everyone is a polluter of the air he breathes, whether he is a cigarette smoker, a leaf burner, a road builder, a construction contractor, an operator of an industrial plant, or just an automobile driver.

The polluted air we breathe is not just filled with inert particles, but with toxic substances. The prime cause of air pollution in most large cities today is the emission of gasses and solids from automobiles and industrial plants. Autos add nitrogen oxides, carbon monoxide. In London, 2,000 tons of carbon monoxide are air borne daily. In New York and Los Angeles, over 10,000 tons are contributed to the air daily. Metallurgical plants contribute such toxic substances as hydrofluoric acid, sodium and calcium fluoride and arsenical compounds. Chemical and petrochemical plants contribute hydrogen and sulphides, chlorine, sulphur dioxide and compounds of selenium, tellurium and beryllium. Other poisons injected into the air of our industrial cities include sulphuric acid, hydrochloric acid and compounds of zinc and lead. Once these poisons enter the atmosphere chemical reactions take place frequently and in many cities it is these secondary pollutants that are the real villains of the piece. In Los Angeles some of the most harmful ingredients of the smog are those produced by sunlight working photochemically on the hydrocarbons that are present in fumes from incompletely burned fuel.

Another feature of air pollution is the sheer bulk of it. During last winter's London smog, smoke and sulphur compounds were being poured into the air at the rate of thousands of tons a day! At its worst the smog is believed to have contained nearly a thousand tons of smoke particles alone. In the Ruhr valley of West Germany, the daily fallout of ashes and soot is put at one and half million tons; that of sulphur dioxide, four million tons. Even in comparatively clean and pleasant a place as Puget Sound, several thousand tons of industrial waste become air-borne and a correct down draft will contribute polluted air generously to neighboring or distant homes.

To make matters worse, the world now has to reckon with pollution from radioactive debris. Nobody doubts any longer that this danger exists and might grow worse even though there is some difference of opinion about the territorial extent of the danger of its immediacy. We all know of the island north of Australia which is still radioactive eight years after the British detonated an atomic bomb there. The first thing the British Atomic Energy Authority did when radioactive debris escaped from its plutonium plant at Carlisle was to quarantine the nearby farms and prohibit the sale of their produce because soil, grass, cattle and milk had all become contaminated.

The full cost of air pollution to the communities producing it and to those that simply "catch" it from their neighbors has never been calculated, and is probably incalculable. Such attempts as have been made to put a price on the damage it does to property, cattle, crops, materials, indicates that in the United States alone it may be as high as 12 billion dollars annually or more than $60 per person. But what price can one put on the 400 lives lost in the 1962 smog or the 4,000 lives lost in one ten years earlier or in the loss of health temporary or permanent suffered by thousands more. How can one weigh the deprivation of beauty, happiness, and comfort which air pollution imposes upon those who have to live with it.

What can be done about this death from the sky? A great deal. Smog in St. Louis disappeared since the late thirties when they prohibited the use of certain types of soft coal. Pittsburgh took legal action against polluters of the air and now you can see the sky and the city! Control measures taken in Los Angeles have halved the volume of contaminants entering the atmosphere in the last fifteen years even though its population has grown from 3,900,000 in 1948 with 9,800 industries to 6,500,000 people with 16,000 industries in 1960. London passed a clean air Act in 1956 and reduced average concentration of smoke over the city by roughly 40 per cent.

Of course, much more can and should be done. Our lawmakers can prohibit the open burning of trash in the backyards and city dumps including the burning of junked cars, tires and batteries. They can demand that excavated sand in building construction be kept wetted down to prevent it becoming air-borne. They can enforce the use of "afterburners" on all gasoline fired vehicles. They can demand that gases and solids that escape from engine exhaust, commercial and residential furnaces and industrial plants be trapped.

Our city planners can make better use of their chief tool of pollution control namely zoning. Being aware of the problem and its urgency of solution will surely lead to other methods arising from the ingenuity of our sanitarians, engineers and meteorologists.

Certain things cannot be done. For example, Los Angeles cannot be moved to an area where, the air is not arid, where winds are not light and impalpable and where air inversion prevents the displacing of air vertically. It is now too late to move the city and they must expect smog, though constantly working to reduce its disastrous consequences by keeping their air less polluted.

Because of the prime health hazard of air pollution CONNECTICUT MEDICINE has dedicated this issue to this important subject and we are all indebted to Professor Leonard Greenburg for the important papers he has assembled.

L.H.N.

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The Peril And The Poison

The peril to the infant in utero that comes from X-ray exposure especially in the first trimester of pregnancy is now well established. Stewart found an increase of cancer mortality up to 90 per cent among children who had been X-rayed in utero in England and Wales. He also found an increase in sensitivity to X-ray during early pregnancy as compared with exposure in later months of pregnancy.[1] MacMahon's study[2] was planned to overcome the principle criticism of the earlier work, with objective evidence from hospital records of intra-uterine X-ray exposures and with accurately controlled estimates of mortality for malignant disease in both exposed and unexposed children. He studied all children born in thirty-seven large maternity hospitals in the New York and New England areas during the years 1947-1954, a total of 734,243 children. Among 584 children who had died of cancer by 1959, sufficiently completed records of 556 single births were located. After correction for birth order and other variables, the average cancer mortality was 40 per cent higher for children who had been X-rayed in utero than for those who had not. The rate was also higher for those irradiated during the first six months than the last three months.

Sternglass,[3] who analyzed both Stewart's and MacMahon's data for cancer mortality as a function of the number of X-ray films taken during a given examination found no evidence for a dose greater than the dose corresponding to one X-ray picture. But if the dose of one X-ray picture is greater than another, then the incidence of cancer will also be higher. There has been an improvement in X-ray techniques from the time of Stewart's studies (1944-51) and MacMahon's studies (1944-54). Dose reductions by a factor of 4-8 had become possible. This resulted from improved films, from better intensifying screens and from higher voltages accompanied by a change from 1-3 mm aluminum filtration of the primary beam. Thus Stewart's sample consisting of children up to the age of ten received the higher dose per picture associated with the older techniques while MacMahon's test population born 1951-54 undoubtedly experienced a lower dose per exposure especially since they were born in some of the largest hospitals in New York-New England area where X-ray techniques were probably most improved. In both cases Sternglass points out that the dose response relationship appears to show no threshold and to be linear down to below the dose received by the embryo in a single pelvic X-ray picture. MacMahon's and Stewart's data tend to support the "single hit" or genetic point defect theory of the radiation damage responsible for childhood cancer and leukemia.

As a result of the above studies, it is now possible to make a direct comparison with radiation from normal background sources and fallout at comparable total doses. Thus typical doses from normal background radiation (75-150 mr) in nine months would suggest that about 5-10 per cent of all childhood cancer and leukemia cases may be traced to the triggering action of natural ionizing radiation.

Doses considerably larger than those average world wide values can result from heavy fallout in certain areas because of unusual meteorological conditions even for relatively small nuclear explosions such as occurred in Troy-Albany area after a 40-50 Kton low altitude explosion in Nevada in 1953.[4] Due to the short time between the formation of fission products and the arrival of the local fallout, the short-lived isotopes present special hazards to the embryo. There were delivered γ radiation from short-lived Zn^{95} and Nb^{95} estimated to have been about 100 mr for the first thirteen weeks after arrival of the fallout in this particular area. Another significant dose to the blood forming bone marrow resulted from the short-lived isotope Sr^{89} Ba^{140} and I^{131} ingested by the mother in particular with fresh milk and vegetables. There is no doubt that these short-lived isotopes present a special hazard for the development of childhood cancer since they give off their radiation in a short time compared with pregnancy (half life of from eight to fifty-three days) and can hit the embryo during the critical phases of rapid cell division associated with organ and skeletal formation.

Starting close to the first trimester the embryo has a tendency to accumulate radioactive iodine consumed by the mother into her own thyroid at a concentration two to ten times that of the normal adult and there is a similar tendency for greater concentration of Sr^{89} and Ba^{140} in the fetal bone structure. I^{131} concentrates primarily in the thyroid and gives a strong β dose to this organ, but it is also carried to the blood-forming centers. Thus the centers nearest the thyroid, perhaps the thymus also, are subjected to the γ rays as well as the β decay of the radio iodine in the embryo's thyroid. Thus the principle danger of I^{131} may therefore not be thyroid cancer which is normally extremely rare in children, but rather leukemia which is the highest single cause of death in children four to fourteen years of age in the U.S.A. other than accidents, and affects one in every 1,000.[4]

The important implications of MacMahon's and Stewart's data as analyzed by Sternglass both for the etiology of cancer and long range after effects of fallout from the detonation of nuclear weapons would seem to make it desirable to extend studies of this whole problem to still larger population samples. It would seem especially important to initiate carefully controlled surveys of childhood leukemia and cancer deaths among children born in areas known to have received heavy fallout doses in the preceding six to nine months. Follow up studies with a test population of children born after the introduction of improved X-ray methods should be

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undertaken accompanied by detailed checks of the average dose received under the prevailing examination conditions. Obviously as X-ray techniques are improved it should be accompanied by a reduction of the cancer peril for all irradiated children in utero. Just as obviously continued testing of atomic bombs should increase the poison ingested by mothers and increase the peril of cancer in childhood.

In 1961-1962 the combined tests of the USSR-U.S. would be expected to produce a nine months dose to the bone marrow anywhere from 150-300 mr.[3] This is of the order of magnitude of the dose to the embryo in a typical pelvic X-ray picture taken with the best modern techniques. In other words every fetus in the world in 1961-1962 received the same attack upon its genetic apparatus as if its mother had been X-rayed in the first trimester of pregnancy. Furthermore, every child born in this year of testing is threatened with a genetic alteration possibly leading to cancer. These are sobering facts that all mothers and fathers must face and having understood them, must not remain silent about atomic testing.

L.H.N.

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To Tell The Truth

"*. . . Much of a race depends on what it thinks of death and how it stands personal anguish and sickness.*"—*Walt Whitman*—Memoranda During the War.

Not too many years ago cancer was a tabooed subject and much discussion in learned circles was concerned with whether talking about it publicly would not promote cancerophobia in the population. It has not. Instead people hear of it, doctors talk of it with their patients and a new climate has been established on this previously forbidden subject. In part this can be attributed to opportunities for early diagnosis and adequate treatment which has led to many cures. We know and the public is coming to know that diagnosis of cancer no longer is necessarily synonymous with a death warrant. Even if an operation is not successful in totally eradicating the primary focus, many months or even years of useful life remain and there always remains the possibility of new chemical and radiological advances which can enter the breach further, contributing to normal function for additional periods of time.

As a result of this change in the medical aspects of cancer and the public attitude towards it, the physician is in a better position than he was formerly when dealing with a patient suffering from cancer, to be truthful with the patient while at the same time avoiding a major emotional upset in the patient. It cannot be denied that the concern of the physician is the entire patient not just the treatment of his disease. Thus he must establish a rapport between himself and the patient to evoke intelligent co-operation in a therapeutic program. At the same time, indiscriminate application of a policy of always telling the patient he has cancer may add unnecessary anxiety to physical suffering in a patient who neither wants or needs the information. When a patient has cancer he needs a doctor who with skill and sympathy interprets the disease to him for this may turn out to be the most important factor in the management of the case but it must be done with delicacy, sensitivity and proper sense of timing.

Apparently surgeons[1] and other physicians who have occasion to treat many patients with malignant disease, generally develop a talent for handling this problem which may differ from the family physician that has had but a limited experience with such patients. It is the surgeon after the operation that knows the diagnosis and prognosis. It is he who may be confronted with the fateful question by the patient. It is he who may be warned by the family to withhold the information. It is he to whom the patient returns when symptoms of a recurrence have appeared, and who has to answer for the reasons of the failure of his operation, or the reasons for another operation. If the surgeon is asked "The question" before he has obtained enough information about the patient's emotional stability, his business or family responsibilities, he can always win a few days of grace by stating that he is waiting for the report of the biopsy. But the fateful question comes up, and when it does, the surgeons generally have found from much experience that truthfulness in the long run is always preferable to deception, no matter how kind the motive prompting the deception. Truthfulness is not synonymous with callousness and brutality, and these can always be avoided in the way in which the information is imparted to the patient.

No one knows exactly how long a patient is going to live and there is always something more that may be done to alleviate the suffering. The family doctor however, receives the patient when the surgeon's work is done. He may find the patient with a lesion that in all probability was cured, or one in which there is a reasonable chance that it is cured. In most such instances he can inform the patient promptly, give him courage and hope. This will encourage repeat examinations and help spread the news that some patients are permanently cured. Such information almost never leads to a significant depression but causes patients to make a philosophic adjustment. It is rare for a patient to lapse into a profound depression upon learning "good" news. The family physician also is left with the patient whose lesion is hopeless and rapidly progressive. Then, many should not be told, unless they specifically ask or have responsibility to others which may be greatly affected. The family physician also is left to care for the patient with a hopeless lesion, but in whom palliation may achieve an essentially normal state of health for many months as in biliary bypass for carcinoma of the pancreas. In patients judged to be unstable emotionally the exact information should be withheld if possible. This is probably a wise course to follow with all patients except those who make a point of asking a direct question.

Answering the patient's question is the safest guide for a surgeon or physician to follow. There are patients who state they wished some questions answered, but fear unpleasant news and end up by asking irrelevant questions about diet or time of discharge from the hospital. Some patients who were told about the possibility of cancer before the operation, never ask about it afterwards. Such guides are more reliable for withholding information than the advice of close relatives or friends to whom every patient is emotionally unstable and unable to "take it." A head of a household or a person in an important business or professional post, who should know his situation and how to plan his future life, should not have information withheld from him, and if he does not make an inquiry about his disease, he should at the proper time be asked whether he has any questions. If he does not, then the doctor's legal and moral obligations have been discharged for such a person, we may assume, is aware of his trouble but does not wish to have it put into words. Similarly there are some patients mostly women but occasionally men who present clear evidence of an immature and dependent personality, rarely ask direct questions and who by their wording of the question such "I don't have cancer do I?" let the physician know that they do not wish to hear that they have cancer.

If the patient has no outside responsibility, or if he has, and a responsible relative knows the diagnosis then no issue need be made of telling it to the patient. In other words, the safest procedure seems to be to assume that the patient will ask questions relating to the things which he wishes answered, but the mode of asking will guide the physician to the appropriate answer. It is in this area that the experience of the physician plays a paramount role. Obviously moribund patients should not be aroused to tell them what is killing them, for the family certainly is aware of the cause of illness. In addition patients with subnormal intelligence or otherwise incapable of understanding the issues, will not be able to assimilate information and should not be burdened with it.

Many reasons are given by the family or friends why a patient should not be informed that he has a hopeless situation. The most frequent and probably most important one is that the patient will go into a depression and will collapse emotionally. The truth is that hardly ever has a patient committed suicide on hearing of such news. It is a rare patient who lapses into a profound depression. The usual experience is to find a brief period of depression as a natural aftermath when a patient learns of a hopeless situation. Actually most patients make a philosophic adjustment and some will even reject the knowledge and create some satisfactory illusion for his psyche. In truth, if a patient lapses into a profound depression, it is the physical suffering that is usually present that is a more likely precipitating cause than the knowledge of his condition.

The family who wishes the patient spared the knowledge of his disease is not aware, as the doctor is, of the pernicious consequences that may result from such ignorance. We have all seen the patient who experiences relief or even exhilaration on the first few days after an operation if he believes something was accomplished. Then with the disappearance of the operative pain the old symptoms will reassert themselves and he will know he is not really improved. It is then natural that he will lose faith in his doctor who has not helped him and who appears to be making light of his symptoms. It won't be long before the family takes such a patient on a round of cancer quacks expending large sums of money to sustain "morale." On the other hand if the family sides with the physician, then the patient may conclude his family is against him. The fact is that withholding knowledge does not lessen the ravages of the disease, rather it may make it worse by reason of the mystery of it. We should always remember that "the patient with cancer is not afraid to suffer and he is not afraid to die but he is afraid of being abandoned."[2]

The responsible physician should have no hesitation in frankly but tactfully and at the correct time answering questions asked by the patient. To be sure he should never estimate probable duration of life and can always point out the availability of additional medical means of helping the patient. The physician will never go astray if he answers the patient's questions truthfully but tactfully.

L.H.N.

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A Test For Cancer Of The Kidney And Bladder

Die methode ist alles—Carl Ludwig

Tumor cells in their metabolism show an extreme dependence for their energy upon anaerobic glycolysis, a process in which lactic dehydrogenase (LDH) plays a cardinal role.[1] The results of such a metabolic alteration, is the liberation of considerable amounts of this glycolytic enzyme and this fact has already been utilized in diagnosis, by measurements of LDH activity of fluids which are in direct contact with malignant cells such as for example pleural fluid from patients with lung cancer.

It therefore should have been anticipated on the basis of the disturbed biochemisty of malignant cells, that the urine of patients with cancer of the kidney or bladder, should have an elevated LDH activity. The fact is that while LDH has been reported to be present in urine, its activity has not previously been utilized in diagnosis. The probable reason for this was the failure to recognize and eliminate an inhibitor of LDH which is present in all human urine. Until a proper method was devised by which the inhibitors were removed, no satisfactory test of LDH activity in the urine was feasible. By dialyzing out the inhibitor Wacker and Dorfman[2] have succeeded in determining LDH activity of the urine and have opened a new area for exploration of tumors of the kidney and bladder.

Cancer of the kidney and bladder have a way of being silent long enough so that nearly half of the cases are already incurable at the time they first appear for definitive treatment. Nevertheless these neoplasms like many others are potentially curable at an early stage if it were possible to recognize their existence. A simple reliable method for early detection of malignancy of the kidney and bladder in the asymptomatic stage, could radically alter the cure rate in these cancers as has the Papanicolaou preparation which has led to a dramatic reduction in mortality in victims of cancer of the uterus. Wacker and Dorman[2] having perfected a method for determining LDH activity of urine have reported their results on screening the urine of 200 patients with all types of diseases of the urinary organs. They found that LDH activity was elevated in the urine in 18 out of 19 patients with cancer of the kidney or bladder. The only exception was a patient who had undergone autonephrectomy of the tumor bearing kidney and consequently this kidney contributed no urine. Certain other diseases of the urinary tract also showed a high LDH activity such as glomerulonephritis, malignant hypertension, lupus nephritis, acute tubular necrosis and few with pyelonephritis, but the differentiation of these diseases from malignant lesions is of course easily accomplished.

The converse was also true. A majority of patients who had non-malignant space-occupying lesions of the kidney or bladder had normal urinary LDH activity. Among 12 patients with benign lesions only one had elevated activity associated with benign cysts. Thus the measurement of urinary LDH activity offers a new and much needed simple objective diagnostic method for detection of cancer of the bladder or kidney.

It is striking that patients suffering from diseases which cause elevated serum LDH activity but with normal urinary organs, have not thus far shown to have elevation of urinary LDH activity. Evidently LDH is not excreted in the urine. If there is an elevation of LDH activity in the urine it signifies a disease of the urinary tract and this finding should certainly serve as a stimulus for further definitive diagnostic study. The method is uniquely applicable to detection of silent malignant tumors with a high degree of accuracy. It is true that cystoscopy and pyelography will detect these tumors with a high degree of accuracy also, but such procedures are confined necessarily to patients in whom symptoms of a serious nature indicate the need for a urologic evaluation. The simple LDH screening test on the urine will uncover those cases of malignancy in the silent phase of their growth, the phase in which cure is still possible thereby leading to a significant reduction in mortality.

All this has become possible because of the development of a new method in science. As science progresses, new methods open up new fields of investigation ultimately to bring faith, new knowledge and understanding of disease, knowledge which we can employ for the sake of our patients' welfare. There is much truth in Ludwig's phrase "die methode ist alles."

L.H.N.

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Problems In The Treatment Of Hiatus Hernia

Hiatus hernia has been called the great mimic of the upper abdomen and lower chest and we must be wary that the diseases which it mimics are really not there. Peptic ulceration, pancreatitis, gall bladder disease and coronary insufficiency are some diseases which must be considered even though radiologic evidence for the existence of a hiatus hernia is present; for not all hiatus hernias cause symptoms and even if they do, the other diseases are not thereby excluded.

Texter et al[1] after careful study of symptoms caused by a hiatus hernia found that they are not related so much to the size of the hernia but to insufficiency of the gastro-esophageal closing mechanism with regurgitation of gastric contents, and the motor dysfunction of the body of the esophagus when the gastro-esophageal pressure gradient is high enough to displace a sufficient volume of irritating fluid into the esophagus. Then heart-burn, esophageal ulceration causing retrosternal pain and dysphagia takes place. Often this can lead to stricture formation and/or gross bleeding with hematemesis or melena, or chronic microscopic bleeding will cause iron deficiency anemia. The character of the irritating fluid varies since they observed heart-burn in cases with achlorhydria and after subtotal gastrectomy. But the effect of the irritating liquid and its duration of action can be decreased by the neutralizing properties of saliva, esophageal secretions, and the sweeping action of esophageal peristalsis. In their patients with motor abnormalities, in addition to sphincter dysfunction twelve of the fourteen patients with diffuse spasm had hiatal hernia, with heart-burn, dysphagia and substernal pain.

Rex[2] found that the prognosis depended upon the original degree of damage and the severity of symptoms. As might be expected 82 per cent of those who had initially only dyspepsia or vague epigastric distress were symptomless ten years later. Compared with 62 per cent of those with intermittent sensations of food sticking; only 39 per cent of those with esophagitis, dyspepsia or regurgitation and 44 per cent of those with bleeding or anemia, were symptomless ten years later and 20 per cent of those with bleeding or anemia had to be operated upon. One interesting finding was that the prognosis did not seem to be altered by the duration of symptoms before the diagnosis was made. We are thus given some idea of what happens to patients who have not been operated upon ten years after the hiatus hernia has been diagnosed. 301 patients originally had a sliding hernia and of these 186 (62 per cent) were without troublesome symptoms ten years later. Ninety-eight patients, (33 per cent) still had symptoms, and seventeen patients (5 per cent) had had the hernia repaired. Fifty-eight patients developed secondary changes, the so-called "shortened esophagus," a group which might be expected to do badly. Nevertheless twenty-two were improved, twenty-seven still had symptoms and nine were operated upon. Of a group of six patients with a para-esophageal hernia four were improved and two still had symptoms. In other words of the group selected for follow up 212 or (58 per cent) were improved ten years later.

This medical follow up study emphasizes the difficult question of what is the best treatment for hiatus hernia. A number of patients will get better whatever the doctor does, whether because of spontaneous reduction of the hernia, improvement in the efficiency of the closure mechanism of the hiatus hernia or lessening of the noxious quality of the gastric juice. Diet and alkali sometimes alters this quality sufficiently to bring relief, and attention to posture during the day and night may reduce the amount of noxious gastric contents reaching the gullet. But these measures require constant attention to detail and are often discomforting in themselves and the patient seldom takes them for long. How doggedly should the doctor persevere in his attempt to make the patient abide by his advice? As the editor of Lancet states "Must each patient earn operation by a specified period of ordeal by fire or water brash."[3] Apparently hematemesis and gastric ulceration in the loculus are transient and only occasionally recurring complications, but stricture is hazardous and tends to be irrevocable. Should we wait for such complications before advising operation?

Poulson et al[4] who have reviewed the complications of hiatus hernia and the effects of treatment in 512 patients seen in a surgical practice have stated the indications for surgery as follows: esophagitis and/or peptic ulceration in the loculus producing pain, heart-burn, dysphagia, bleeding or perforation; incarceration, obstruction or strangulation, pulmonary complications, such as "spill-over" disease of the lung, persistence or progression of distressing symptoms in spite of reasonable attempt at medical treatment. They point out that the operative technique has been changed radically since 1958 so that of 110 patients who have been operated upon since then by a revised technique for which they give credit to Allison,[5] Hayward,[6] and Hum-

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phrey[7] one patient showed a recurrence, but there were five peri-operative deaths, three attributable to the operation, one to coronary occlusion and one to pulmonary embolus. The operation consists of reconstructing the hiatus by sutures behind the esophagus. They repair the phreno-esophageal ligament by approximating its fibrous insertion into the esophagus above the cardiac sphincter to the undersurface of the hiatus by an extra peritoneal mattress stitch. This procedure produces a snug hiatus, a firm anchor for the esophageal tube and an intra-abdominal flaccid segment of the esophagus.

Nevertheless certain problems are still unanswered. One is the variation in success rates between one surgeon's treatment and another. This variation may be due to differences in selection of patients, because as was noted above many patients get better spontaneously. Those surgeons who operate only on the physically and mentally desperate patient will naturally have a smaller percentage of "cures" than those who operate on early uncomplicated cases. There must be other reasons too that one can think of. One is repairing a hernia which is not the cause of the symptoms of which the patient complains. Another refers to the technique the surgeon employs which might produce improvement more by luck than by planned restoration of the mechanical and physiological situation.

The problem of what surgical procedure is best is still a difficult one and those surgeons who can report a high success rate are more likely to publish their results than are those whose successes are not so frequent. One could suppose that the reported techniques are the ones offering a proper basis of a repair. But the less successful surgeons who are not publishing their results may be using the same techniques.

Another question still in doubt is whether the thoracic approach is fundamentally better than the abdominal. The surgeon in training is not yet committed by habit to the use of either of these approaches and here we have a good problem to study by controlled trial of procedures and approaches, which is the preferable method and under what conditions? Since each protagonist believes in his own method we obviously must resort to science or statistics to tell us which is best.

L.H.N.

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The Control Of Urethral Catheter Infections

The use of urethral catheters is responsible for bacterial infections of the genitourinary tract, some quite severe. The reported incidence of significant bacteriuria (more than 100,000 bacteria per cc. of urine) following single or intermittent catheterization varies from two to eight per cent in different studies. The incidence rises abruptly when an indwelling catheter is used.

The catheter is too often employed like a blunt instrument, irritating the urethral mucous membrane and favoring invasion. With the indwelling catheter, bacteria also enter the bladder along the film of mucus which forms around the catheter, or along the lumen of the catheter from drainage bottles. Why the bacteria persist and multiply in some patients and not in others is obscure. Stasis of urine due to obstruction of the urinary tract, or to neurological disease, markedly increases the likelihood of infection after catheterization. Because of this risk, catheters should not be used when other methods are available.

Indications for the use of a Catheter—Catheterization is frequently used to relieve obstruction due to organic disease or spasm. Although it is often employed to measure residual urine, other procedures such as dye dilution and intravenous pyelography may be preferable (R. S. Cotran and E. H. Kass, New Eng. J. Med., 259:337, 1958). Simply letting the patient void will often make catheterization unnecessary before delivery or a surgical operation. For the detection of pyuria and bacterial identification and sensitivity tests, not catheterization but a cleanly voided mid-stream portion of urine should be used.

When catheterization is necessary, the risk of infection can be reduced by proper surgical techniques, including cleansing of the urethral meatus with soap and water followed by flushing with sterile water, and the use of sterile gloves and a sterile catheter. The catheter should be soft, small in caliber, and gently handled.

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THIRTY-EIGHTH CONNECTICUT CLINICAL CONGRESS
of the
CONNECTICUT STATE MEDICAL SOCIETY
and the
YALE UNIVERSITY SCHOOL OF MEDICINE

YALE-NEW HAVEN MEDICAL CENTER
333 Cedar Street, New Haven

SEPTEMBER 27, 1963

The 1963 Clinical Congress will be concentrated in one day and all sessions will be held in the modern Mary S. Harkness Memorial Auditorium in the Sterling Hall of Medicine on Friday, September 27, 1963 from 9:45 A.M. to 5:00 P.M.

The program for the 38th Clinical Congress will be devoted to "Radioisotopes in Clinical Medicine." Scientific equipment will also be displayed.

Subjects and speakers are as follows:

- A look at the Clinical Use of Radioisotopes
  - Lee E. Farr, Houston, Texas.
  - Sergei Feitelberg, New York.
- Clinical Pathological Conference.
  - Ivan L. Bennett, Jr., Baltimore, Maryland.

- Isotopes as an Aid to the Clinician
  - Blood and Blood Volume—Louis R. Wasserman, New York.
  - Kidney and Kidney Function—Richard P. Spencer, Buffalo, New York.
  - Liver and Gastrointestinal Tract—Merrill A. Bender, Buffalo, New York.
  - Thyroid and Thyroid Function—Solomon Silver, New York.

The Yale-New Haven Medical Center is easily reached from the Connecticut Turnpike (via Exit 47) or from the Wilbur Cross (via Exit 61) or Merritt Parkway (via Exit 57).

COME FOR THE WEEKEND—Attend the Clinical Congress on Friday, and the following activities on Saturday, September 28. Surgical and Medical Grand Rounds at the Yale-New Haven Medical Center on Saturday morning and the University of Connecticut-Yale Football game on Saturday afternoon. Tickets may be obtained from the Yale Athletic Association, Yale Station, New Haven.

Luncheon for visiting physicians will be served in the cafeteria of the Grace-New Haven Community Hospital.

The registration fee of $5.00 provides for admission to all sessions of the Congress. Hospital residents and interns will be admitted without charge, if a statement of their position, signed by an official of the hospital, is presented at the registration desk.

PLAN NOW TO ATTEND

THE PRESIDENT'S PAGE

Organized Medicine—The AMA

I attended the AMA convention in Atlantic City in June—in my capacity as a state society officer and your president. The experience was a revelation.

In the past, when I went to AMA conventions, I confined my attendance to the usual sitting in on clinical symposia, visiting the exhibits, and treating my aching feet. If I sensed any of the important activities of the House of Delegates, the hearings of the reference committees, or the elections of officers, it was with little or no appreciation of their significance.

This year I found myself in the higher echelons of organized medicine, and what I saw and participated in opened my eyes to many of the reasons for organization which I had sensed only dimly before.

"What does my medical society do for me?" Isn't that a familiar phrase? I'm sure you've heard many of your colleagues express themselves in just those words, if indeed their opinions weren't expanded to include other cliches such as: "The AMA is a reactionary, outdated organization;" "It is against everything;" "It is a confused bunch of medical politicians;" "It is clique ridden;" "It is self-perpetuating;" etc., etc.

If they were true, these cliches would paint a sorry picture of organized medicine indeed. Such criticisms are to be expected from uninformed lay people, politicians with axes to grind, or the numerous self-interested pressure groups which abound on the fringes of medicine. That doctors, who should know better, often cast similar stones at organized medicine is difficult to understand.

Even the busiest practitioner must know that his choice is limited. If not organized medicine, then what? Perhaps a little more personal participation in his associations' work would enlighten him enough so that his criticisms of them would be more informed and more constructive!

Truth of the matter is, the men I saw in action at Atlantic City on behalf of American Medicine are superior physicians—well-informed, articulate, and aware of the constant struggle for freedom from socialization, which has been the greatest menace of our profession since welfare-stateism became the primary goal of government. One would expect that opposition to something of such emotional and potentially popular appeal as socialized medicine would arouse universal opposition to its opponents. But, on the contrary, we have many influential friends in many places—congressmen and senators, business men, lawyers, farmers and just ordinary people.

At the conference of officers of state medical societies, several hundred of us were addressd by counsel for the House Ways and Means Committee, an executive of the National Chamber of Commerce, a former finance minister of Hungary who is now Director of International Studies at Bradley University, and by a most articulate member of Congress. These informed people do not consider the AMA to be a stodgy, ponderous, antiquated, self-interested organization. They hold it in high esteem and look upon it as an efficient, unselfish, public-spirited representation of the physicians of America, with which they have the deepest sympathy. Their warning was not that we lessen our opposition to socialization, but rather to urge us on for fear that we might accept compromise in our effort to secure for ourselves the freedom we desire and hold dear.

When you think about it, this is as it should be. For make no mistake about it, there can never be just a little bit of socialization. We and our well-wishers know that once socialism takes over medicine, it will spread rapidly through all other free enterprise in our nation.

In AMA, we elect a new president each year. Contrast this practice with that of organized labor. AMA officers do not perpetuate their leadership as do so many union officials. At AMA meetings, there are no demands laid down for higher pay, for a thirty hour week, or for additional fringe benefits. Instead, the Association's energies are primarily directed toward preparing scientific exhibits, and presenting the newest procedures in medical diagnosis and treatment, all of which are freely given to the world so that the public health can be advanced. Viewed in its true light, the AMA is an organization to be proud of; one which merits our support. And the dues are much lower than union members have to pay!

Morris P. Pitock, M.D.

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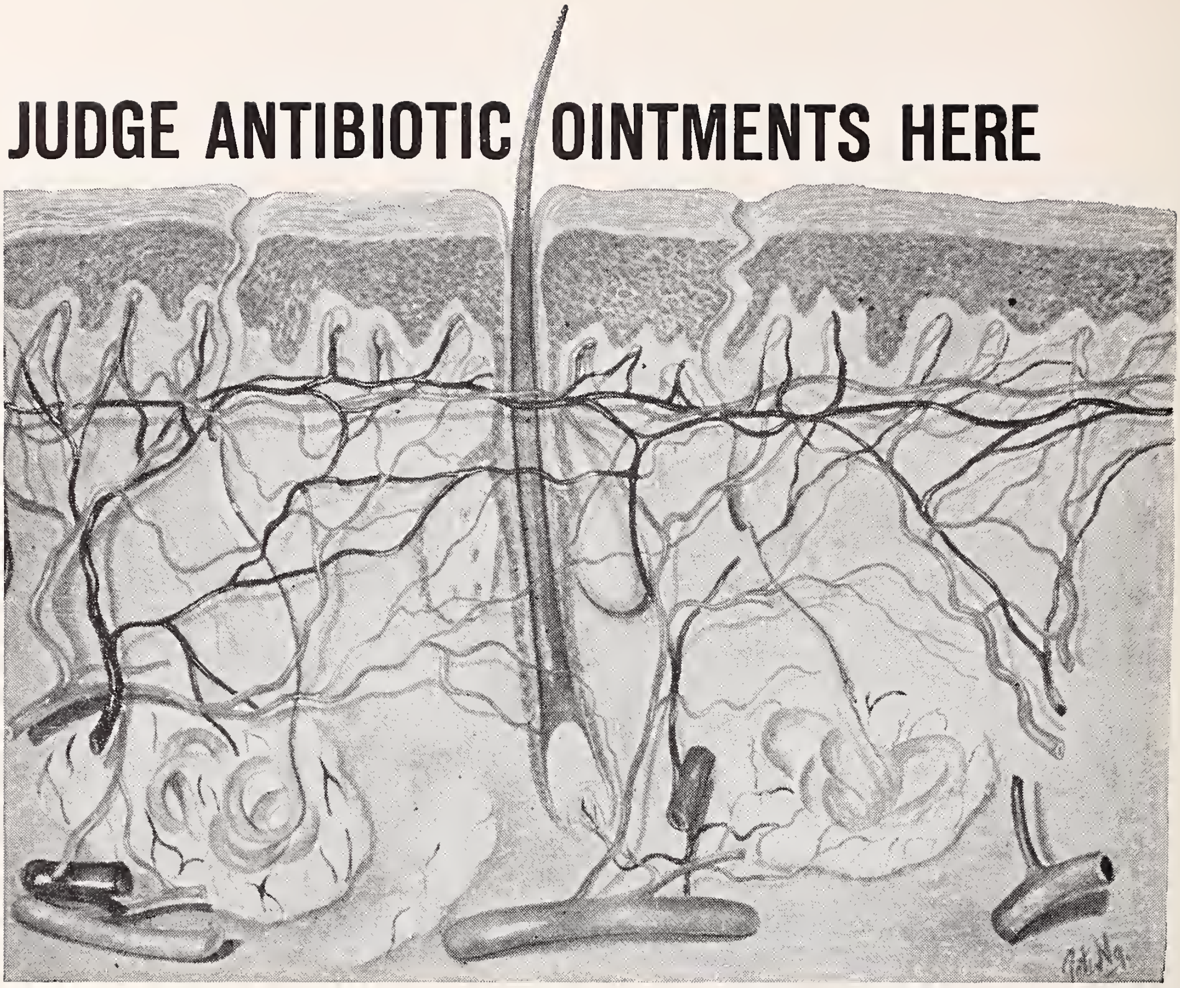

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Effects Of Air Pollution On Man

JOHN R. GOLDSMITH, M.D.
Berkeley, California

Introduction

WHEN man learned to use fire, the biophysical equilibria which affected the well-being of the human species was tipped in favor of man and of the advancement of his technology.

Now increasing human populations, living standards, and per capita energy use threatens, in urban areas particularly, to exhaust the atmosphere's capacity for waste disposal and the equilibrium, previously so favorable to technical advancement, may well be altered.

The need for better management of our atmospheric resources is beginning to be recognized. Prior to adopting policies requiring more efficient combustion, dispersal of industry or populations, installation of control equipment, or other means for allocating the use of the atmosphere, it is advisable to scrutinize the primary use of the atmosphere, its use for man's vital processes and well-being, and the threat to these uses posed by air pollution.

Pollution may arise from many sources. To simplify the presentation, only the pollutants arising from motor vehicles and from heat and power production will be considered, because it is these activities which are most frequently a source of difficulty, and require policies which affect wide areas of the country.

Effects Of Motor Vehicle Contaminants

With our unaided senses we can recognize readily that motor vehicle emissions sometimes produce a visible cloud and on other occasions are malodorous. Most of the exhaust contaminants produce more subtle effects. For their detection, these air contaminants require sensitive physical and chemical apparatus and it is they which have been recognized as the major cause of the air pollution problem currently plaguing Los Angeles, San Francisco, Washington, D. C., and other large cities.

While the concentrations of pollutants may be of substantial magnitude in the motor vehicle's exhaust stream, the concentration in the community's atmosphere is substantially less. As a convenient rule of thumb it can be recalled that the concentration in the area around a stream of rapidly moving cars will be approximately three orders of magnitude less than the averaged concentration of exhaust of the cars moving in that stream. That is, there is about one one-thousandth as much of the several pollutants likely to be in the atmosphere adjacent to a stream of vehicles as is being emitted by these vehicles themselves. Wide fluctuations, of course, occur in this ratio depending on weather, the location of sampling and the manner in which the motor vehicles are operated.

Exhaust Contaminants Of Public Health Importance

Although motor vehicle exhaust contain carbon dioxide, nitrogen, oxygen, water, vapor and occasionally some hydrogen, these substances are of relatively little public health interest. The exhaust ingredients likely to affect the public health include aldehydes, carbon monoxide, a variety of hydrocarbon compounds, oxides of nitrogen, lead, and depending on the sulfur content of the fuel, sulfur dioxide.[1] Table I contains the estimated ranges of these substances in automobile exhaust.

Health effects are related to pollutants in the following fashion:

1. The aldehydes are either irritants or substances with an unpleasant odor;
2. Carbon monoxide represents a subtle asphyxiant;
3. The class of hydrocarbons includes: a) small concentrations of carcinogens, b) hydrocar-

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DR. JOHN R. GOLDSMITH is Head of Air Pollution Medical Studies, Bureau of Chronic Diseases, California State Department of Public Health.

Table I
Composition of Automobile Exhaust

CONSTITUENT	CONCENTRATION (PARTS PER MILLION) MINIMUM	MAXIMUM
Aldehydes	0	300
Carbon dioxide	50,000	150,000
Carbon monoxide	2,000	120,000
Hydrocarbons	100	20,000
Hydrogen	0	40,000
Lead compounds	[1]	[1]
Nitrogen	780,000	850,000
Oxides of nitrogen	0	4,000
Oxygen	0	40,000
Sulfur dioxide	[2]	[2]
Water vapor	50,000	150,000

[1] Depends on lead additives.

[2] Depends on sulfur content of fuel, usually insignificant in gasoline, but sometimes present in diesel fuel.

bons which when reacted with oxides of nitrogen in sunlight, produce the "smog" effects of eye irritation, interference with visibility, and characteristic damage to vegetation, c) the photochemical reaction also produces ozone.

4. Nitrogen oxides when in sufficiently high concentration are capable of producing effects on health, and at lower concentrations they participate in photochemical reactions. Both nitrogen dioxide and ozone act as irritants but may produce pulmonary fibrosis.
5. Lead compounds are of concern because of the body's tendency to retain lead when it is inhaled in the form of small particles.
6. Sulfur dioxide is of possible concern as an added source of this agent but this source is of small magnitude compared with emissions from heating and power generation.

Our major concern is with the acute effects of irritation, the possibility of accumulation of the asphyxiant carbon monoxide, the possibility that under extraordinary weather conditions a disaster may develop, the possibility of chronic toxicity of lead and possible long-term effects such as the production of lung cancer or other chronic respiratory diseases.

Table II shows the various pollutants in motor vehicle emissions as well as some other air pollutants, and the limits or tolerances in industry for eight hour daily exposures of healthy persons. Also shown in this table are the maximum values observed in the community air in the United States for a number of these pollutants.

Acrolein and formaldehyde are both representatives of the class of aldehydes. Acrolein itself is not found in motor vehicle emissions nor is hydrogen sulfide. Of the particulates, lead is the only one of

Table II
Comparison of Industrial Threshold Limits "M.A.C.," with Maximal Air Pollution Values

SUBSTANCE	UNITED STATES INDUSTRIAL THRESHOLD LIMITS "M.A.C."[1] P.P.M.	MG/M^3	MAXIMAL AIR POLLUTION LEVELS	PLACE AND DATE WHERE OBSERVED
Gases				
Acrolein	0.5	1.2	—	—
Carbon monoxide	100	110	88[a] P.P.M.	Los Angeles, California, 1958
Fluoride (as HF)	3.0	2.0	0.08[b] P.P.M.	Baltimore, Maryland, 1950
Formaldehyde	5	6	1.87[a] (Aldehydes as Formaldehyde) P.P.M.	Pasadena, California, 1957
Gasoline	500	2,000		
Heptane (n-Heptane)	500	2,000	4.66[a] (Total Hydrocarbons) P.P.M.	Los Angeles, California, 1957
Hexane	500	1,800		
Hydrogen sulfide	20	30	0.9[b] P.P.M.	Santa Clara, California, 1949-1954
Nitrogen dioxide	5	9	1.3[a] P.P.M.	Los Angeles, California, 1958
Ozone	0.1	0.2	0.90[a] P.P.M.	Los Angeles, California, 1955
Sulfur dioxide	5	13	3.16[b] P.P.M.	Chicago, Illinois, 1937
Particulates				
Arsenic	—	0.5	0.00065[b] mg/M^3	—
Beryllium	—	0.002	0.00011[c] mg/M^3	Pennsylvania, 1958
Lead	—	0.2	0.042[b] mg/M^3	Los Angeles, California, 1949-1954
Sulfuric acid	—	1	—	—
Vanadium—dust	—	0.5	0.0004[b] mg/M^3	Cincinnati, Ohio, 1946-1951
fume	—	0.1	—	—

[1] Threshold limit value for 1962—*American Conference of Governmental Industrial Hygienists.*

[a] Los Angeles, Air Pollution Control District.

[b] Stanford Research Institute.

[c] Sussman, Lieben, and Cleland.

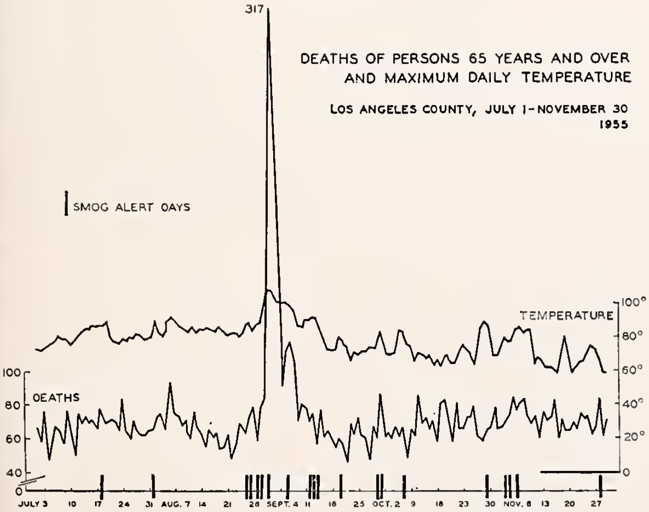
major concern. The entries for gasoline, heptane and hexane are included to indicate that these substances as vapors are of no direct significance; rather, their significance derives from their role in photochemical reactions. While it can be observed that with the exception of ozone, air pollution levels have been consistently less than the industrial exposure limits, it is a population of employed workmen for whom the industrial exposure limits are designed. The population of persons exposed to any air pollution levels in the community include all the members of the community; they include the premature infant, the child with asthma, the adult who may be undergoing surgery or who may be afflicted with acute illness, as well as the elderly and infirm. Industrial exposure limits are specified as being for eight hours, while community exposures are for unspecified and unpredictable periods. For these reasons it is inadmissible to permit the community level to be based solely upon the levels permitted in industrial exposures.

The community levels of almost all pollutants fluctuate with time and with place, whereas the industrial exposures, and the scientific work upon which their exposure limits are based, are usually constant exposures for a predictable and easily-measured period of time. There is unfortunately, very little evidence concerning the relationship between exposures to fluctuating levels that occur in community air pollution and exposures to constant levels for which most of the data are available.

The Epidemiologic Approach

Epidemiology is the scientific study of processes which affect the health of groups of people. As contrasted with other contributions of medical science, concerned as it is with individuals, the work in epidemiology is largely non-experimental. This means that the changes observed and the things that might be associated with them are often not related in an experimental system in which the experimenter arranges the variables to answer his question, rather they are related by the natural occurrence of these phenomena. The conclusions which may be drawn from epidemiologic studies in air pollution depend on the ability of the investigator to select the proper group of exposed individuals for investigation and to classify the possible observations in ways that are reasonably related to the possible effects of exposure. One example of such classification would be the study of the responses of premature infants in a population or the study of elderly persons confined to nursing homes. Figure I is an example of the observations of daily mortality amongst persons 65 years and over in Los Angeles. Whereas, for all the periods of time in which these data have been examined there are only minor perturbations in the number of daily deaths, during the period shown in this figure, there was a striking increase in mortality. This period represents a heat wave which was preceded and followed by severe air pollution. This presented a difficult problem as to whether the increase was caused by heat or by air pollution, or by some combination. The tentative conclusion is that the major role was that of heat. Two reasons exist for this conclusion; the mortality decreased as the temperature fell despite the fact that pollution remained high, and during a comparable heat wave in 1939, when pollution was much less, there was a comparable excess of mortality. We feel that motor vehicle air pollution may be a cause of excess mortality; it has not so far been shown to be so for any group studied.

FIGURE I



Source: U.S. Weather Bureau, State of California, Department of Public Health, Death Records.

More recently, experimental human exposures have been undertaken and the relationship between experimental studies and epidemiologic studies should become more intimate as research progresses.

Acrolein

It has been shown that acrolein is formed during photo-oxidation of 1,3-butadiene. The primary importance of acrolein is that it is capable of causing eye irritation at very low concentrations; namely, 0.1 parts per million. There has been relatively little field measurement of acrolein and there remains some doubt as to how much of the substance may be present. In one report, 0.01 parts per million were observed in Los Angeles.[2]

Formaldehyde

Formaldehyde, as such, probably does not occur in motor vehicle emissions; however, it may be formed readily from any of the olefinic hydrocarbons by photo-oxidation.

Other aldehydes are responsible for the odor of motor vehicle emissions, particularly diesel exhaust. The exact relationship between levels and unpleasant odors are not very well known.

Carbon Monoxide

Carbon monoxide is a colorless, non-irritating gas which is produced by incomplete combustion of many sorts. In general, its production from motor vehicle exhaust is based on the fact that the air-to-fuel ratio in motor vehicles is richer than is required for complete combustion.

The average person, assuming that he starts with none in his body, will absorb a fraction of the carbon monoxide which he inhales.[3] The predominant effect of carbon monoxide is to combine with hemoglobin in a very stable compound which is 215 times as stable as the compound of oxygen and hemoglobin. At low concentrations it takes several hours for the body to reach an equilibrium with the carbon monoxide in the atmosphere; at equilibrium it can be estimated that about one-sixth of one per cent of the body's hemoglobin is inactivated per each part per million of carbon monoxide in the air. Healthy persons begin to complain of headache on exposures to about one hundred parts per million; however, it is inevitable that at lower levels a proportionate inactivation of hemoglobin occurs. It has been shown by McFarland and associates[4] that the sensitivity of the eye to faintly illuminated objects begins to be impaired at a level of from five to ten per cent carboxyhemoglobin. Physiologic data indicate that exposure to an average concentration of carbon monoxide of about 30 parts per million for eight hours is likely to produce five per cent carboxyhemoglobin. Cigarette smokers who inhale may have up to eight per cent carboxyhemoglobin, and a few may have even more. With the same air pollution exposure, cigarette smokers may therefore have greater amounts of carboxyhemoglobin.

It is felt that the group in the population most sensitive to carbon monoxide exposures would be those persons with severe cardiovascular or respiratory conditions. For example, if a person had a critically narrowed blood vessel and the oxygen-carrying capacity of the blood were reduced by five or ten per cent, this small straw, as it were, could well impair the health of the person. While it is, therefore, difficult to prove that any given individual has been made ill by carbon monoxide as a community-wide pollutant (that is in the range of 10 to 100 ppm), it is virtually certain that there is some risk to the population from exposures to levels that will produce five per cent of carboxyhemoglobin.

The ambient air quality standards set for carbon monoxide by the California State Department of Public Health are thirty parts per million for eight hours. This standard is at the "serious" level, because of the effect is on the body's capacity to transport oxygen by the hemoglobin in the blood.[5]

Lead

The addition of tetraethyl lead to motor fuel produces in urban areas an increased pollution by inorganic lead which is emitted with motor vehicle exhaust. While the substances added are organic, such as tetraethyl and tetramethyl lead, the processes of combustion in motor vehicles leads to the formation of inorganic lead compounds, such as complex ammonium, chloride, and bromine salts, as well as some phosphates, depending on the addition of phosphorous additives.[6]

Of greater importance than the chemical composition of lead is the particle size in which it occurs. In general, high-speed driving leads to the emission of a larger proportion of large particles, and lower-speed driving to a greater emission of small particles. This is of very substantial importance, since inhaled particles may have one of two fates, in part, depending on their size: 1) particles that are below one micron in diameter usually impinge in the deeper portions of the lung and are there retained and absorbed; 2) particles with a diameter of substantially greater than one micron usually stick in the air tubes on the mucous layer which is continually moved up the tracheobronchial tree to the pharynx by the cilia. From the pharynx the particles entrapped in this layer are usually swallowed. There, under the action of the digestive processes, a small fraction of lead may be absorbed. In general, it can be assumed that a third to one-half of the inhaled lead of less than one micron may be retained in the body, whereas, only about one-twentieth to one-tenth of that which is swallowed will be retained. From a series of studies in our Department we observe fifty to eighty per cent of the weight of lead present in the atmosphere to be in particles of less than one micron. This needs to be repeated in other localities.

Two recent studies have shown the very close correlation between levels of atmospheric lead and traffic density as well as carbon monoxide.[7]

The Public Health Service, the California State Department of Public Health, the Philadelphia City Health Department, and the manufacturers of tetraethyl lead have initiated a number of studies of atmospheric levels and their possible relationship to blood and urine levels. The plan is to obtain environmental measurements and blood lead values and urine lead values from population samples in three cities: Los Angeles, Cincinnati, and Philadelphia. Several different populations in each city will be studied and data will be obtained concerning their exposure to automobile exhaust. One group in each of the cities will consist of traffic policemen whose exposure may be considered to be much greater than the average of the population.

In California, as well as in other parts of the country, it has been shown that groups of persons living in rural areas have lower mean blood levels than persons living in urban areas.

While the finding that there may be a higher blood lead level in persons with exposure to motor vehicle exhaust would certainly suggest the presence of a significant exposure, it does not necessarily indicate that the exposure has produced damage; inorganic lead toxicity would first show up in the subtle metabolic processes occurring in the formation of the body's red blood cells. However, the most conservative goal for public health in this area is agreed to be the prevention of any increase in body burden. The measurement of bood lead levels is a convenient estimate of this value. Also being undertaken is the measurement of the lead content in organs of persons whose deaths were unexpected. Some of this work is currently underway, but such specimens are difficult to obtain.

The Photochemical Mixture

The three most troublesome effects of air pollution in Los Angeles are eye irritation, interference with visibility, and characteristic damage to vegetation. Although much recent progress has been made, the exact chemicals responsible for these three effects are not known for certain. For example, one group suggested that acrolein and formaldehyde accounted for the eye irritation observed.[8]

Another group has called attention to the role of peroxy-acyl nitrate (PAN) as an agent which is capable of producing both eye irritation and characteristic vegetation damage at levels likely to occur in Los Angeles.[9] A recent finding concerns the important role of minute levels of sulfur dioxide in producing light scattering from the products of photochemical reactions of nitrogen dioxide and hydrocarbons.[10] These concentrations of sulfur dioxide are of the order of magnitude which have been occurring in Los Angeles. Sulfur dioxide does not appear to increase the amount of eye irritation from photochemical reactions.[11]

The application of this new knowledge may provide important results in health effects research; however, there are relatively few measurements of peroxy-acyl nitrate that have been made in the community's atmosphere and little is known of its toxicity to humans beyond the fact that it is a hazardous substance to handle in concentrated form and that it is capable of producing eye irritation.

"Oxidant" As A Measure Of Severity For Photochemical Pollution

For practical purposes, however, it has been customary, and will continue to be so, to indicate the approximate severity of photochemical pollution in the Los Angeles area by the measurement of the oxidizing properties of the atmosphere. This is conventionally done by the use of a potassium iodide solution and the results are recorded as "oxidant." A fairly good correlation of eye irritation with oxidant readings in a variety of stations in Los Angeles has been established. A similar correlation has also been shown to occur in San Francisco.[12] A similar relationship, but not quite as good a correlation, is found for interference with visibility and oxidant.

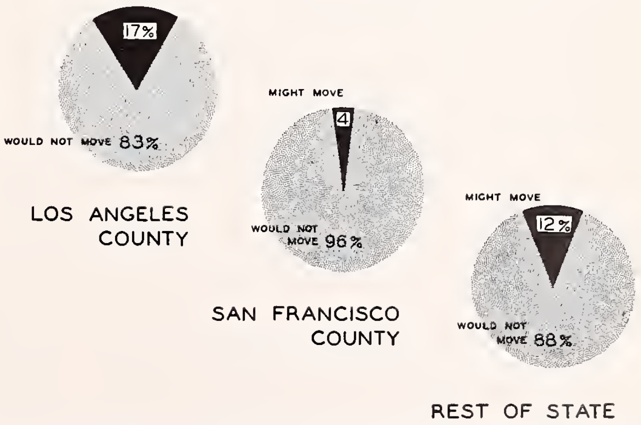
What is not usually appreciated by persons unfamiliar with Los Angeles is the very high proportion of persons who are bothered by the photochemical air pollution in this area. This proportion is nearly three-fourths of the adult population. A substantial proportion of persons are bothered sufficiently by air pollution so as to give serious thought to moving. This is shown in Figure II. Another group of persons attribute moves within California in the past to the over-all effects of air pollution.

A largely unresolved question consists of the extent to which this type of air pollution may cause human disease. This is a difficult matter to study because it is so difficult to conduct experimental exposures. Some idea of the possible extent

Figure II

PROPORTION OF ADULTS BOTHERED BY AIR POLLUTION WHO HAVE SERIOUSLY CONSIDERED MOVING

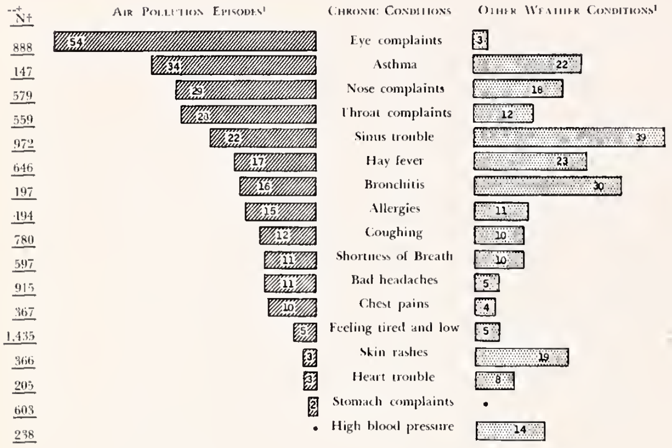
(BY AREA OF PRESENT RESIDENCE)



Source: State of California, Department of Public Health, California Health Survey.

Figure III

Changes in Chronic Conditions Related to Air Pollution and Other Weather Conditions



¹ Per cent reporting a change in condition.

† Numbers are those individuals in a weighted probability sample of the California adult population who reported that they had a chronic condition and responded affirmatively to the question, "Does it bother you more on some days than others?"

* Less than one per cent.

of these effects may be shown in Figure III which indicates some chronic conditions and selected factors reported to aggravate them among a probability sample of individuals throughout the State. When asked if they had a series of chronic conditions, if they said that they did, they were then asked what things seemed to make these conditions worse. The percentage indicating that air pollution made their condition worse is compared in the figure with the per cent reporting that other weather factors aggravated their condition. The importance of respiratory conditions is strongly suggested.

Of great interest have been findings reported by Motley, Leftwich and Smart,[13] who studied a group of men with a chronic, often severe, emphysema. These workers observed that if men with severe emphysema, during smoggy weather, were placed in rooms which had activated charcoal filters, their pulmonary function improved over a period of about two days. No improvement was observed if the persons were put in similar rooms during weather which was not smoggy, nor was any improvement observed in persons without emphysema placed in such rooms.

Ozone

A major ingredient of the photochemical reaction is ozone. Though it is known not to be able to produce the characteristic effects of eye irritation, plant damage, and visibility impairment, ozone itself does cause a form of plant damage different than the so-called oxidant type. One important relationship of plant damage to human health may lie in the fact that metabolic changes in the systems of plants may also occur in humans.[14]

Ozone can be detected by odor at concentrations from 0.015 to 0.1 ppm and is unpleasant for some persons at concentrations as low as 0.15 ppm. At levels of about 1.0 ppm it can probably produce interference with lung function in relatively healthy persons. Although this interference may not be of great significance to such persons, it may be of more importance to persons with chronic illnesses. At about 6.0 ppm, ozone produces a very extensive amount of pulmonary damage. In one report[15] 0.5 ppm ozone inhaled for three hours a day, five days a week for six weeks by six human volunteers, led to decreased pulmonary function.

In experimental animals, 1.0 ppm of ozone for eight hours a day for about one year produces pulmonary fibrosis in the rat and guinea pig, less damage in mice and hamsters and no detectable effect in dogs.[16] In combination with other exposures, the effects of ozone may either be augmented (thyroid hormone or hydrogen peroxide) [17] or reduced (oil mists and anti-thyroid drugs).[18] In animals, ozone exposures at levels as low as 0.3 ppm lead to protection against subsequent higher exposures.[19] It is not known whether all of these mechanisms affect human health.

Nitrogen Oxides

The two major oxides of nitrogen have substantially different types and degrees of severity of human health effects. Nitric oxide (NO) has not been known to cause human toxicity. In animals, it is something like one-fifth as toxic as nitrogen dioxide (NO_2).[20]

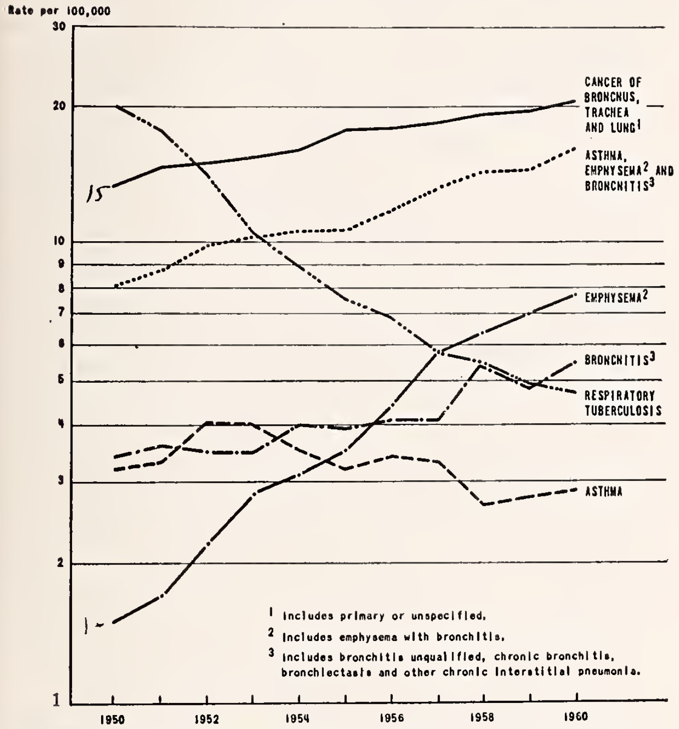
Nitrogen dioxide is a respiratory irritant and, in near-lethal concentrations, can lead to fibrosis of the lungs which develops over a period of time. The lowest level at which acute effects have been reported on humans is 5.0 ppm, at which level there is an unconfirmed report of intereference with the vital capacity of asthmatic patients. This needs further investigation.

Photochemically Produced Aerosols

Since the pollutants in Los Angeles are known to be associated with very small submicron aerosol particles (and these particles themselves are the major cause of interference with visibility), it is most likely that the particulate material resulting from photochemical reactions is carried deeply into the lungs. For these reasons there is considerable concern about the possibilities that such exposures may be associated with chronic lung diseases. So far, a careful study of chronic

Figure IV

Death Rate Due to Selected Respiratory Diseases
California 1950-1960



Source: State of California, Department of Public Health, Death Records.

disease rates in Los Angeles fails to show that there has been an increase in this area which is significantly greater than in those parts of the State which are not affected by air pollution. Since it may take a number of years for such effects to occur, this is no basis for complacency. The rates for a number of chronic respiratory diseases have been increasing quite rapidly throughout the State, as is shown in Figure IV.

Present Basis Of Air Quality Standards For The Photochemical Complex

Based on the association of eye irritation and oxidant, the present air quality standard of 0.15 ppm was established in 1959. Current work is underway on possible standards for ozone and nitrogen dioxide. A serious deficiency in our knowledge at the present time concerns whether photochemical pollution products can cause lung cancer or chronic lung disease.

Pollutants Emitted From Home Heating And Electrical Power Production

A major category of pollutants are the oxides of sulfur together with droplets of soot and hydrocarbons which are emitted from either power plants burning coal and fuel oil or from homes, primarily those heated by coal or oil. This class of pollutants has been responsible for the London disasters of 1952 and 1962[21] and has been thought to be related to increased mortality and morbidity observed in New York City and adjacent areas in 1953.[22] This group of pollutants together with other industrial pollution sources was probably responsible for the Donora disaster in 1948 in Pennsylvania.[23] In contrast to the motor vehicle class of pollutants, the primary effect of which is oxidizing, this group of pollutants are, by definition, reducing substances. Interactions between these two groups no doubt occur but have been little studied.

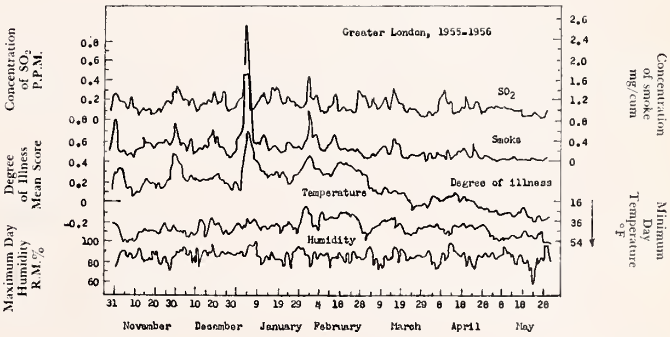
It is characteristic of this group of pollutants to have high emissions during particularly cold weather when the use of fuel for power and heating is greatest. Unfortunately, some types of cold weather are also associated with stable atmospheric conditions and the formation of fogs and even ice particles at near freezing temperature. It is this class of pollutants also which formerly gave the city of Pittsburgh its dreary reputation as one of the dirtiest cities of the world. However, vigorous industrial control programs and a substantial shift from soft coal for home heating to natural gas and fuel oil has very substantially reduced pollution levels.

Soot

Students of air pollution and health effects in Great Britain have shown clearly the need for the presence of both high levels of sulfur dioxide and high levels of soot in order to produce changes in mortality and morbidity,[24] Figure V. Measurements of sootfall are amongst the oldest air pollution measurements, but paradoxically the particles which fall out into an open container are the particles of a size least likely to have a human health

Figure V

Graph Showing Degree of Illness of a Group of 180 Patients in Greater London with Chronic Bronchitis Plotted with Smoke and SO_2 Concentrations, Temperature and Humidity



Source: Lawther, P. J., Dr., (Medical Research Council Group for Research on Atmospheric Pollution, St. Bartholomew's Hospital, London). Climate, Air Pollution and Chronic Bronchitis.

effect because these large particles are filtered out in the nose, throat, or trapped in the mucous layer of the respiratory tree. While the minute particles are not estimated by simple sootfall devices, they can be detected by paper strip sampling and such measurements are also closely associated with the soiling properties of air pollution levels.

Soots are usually quite porous in their structure and this gives them a very large surface to mass ratio. This is extremely important since many soots are generated by combustion which also generates carcinogenic hydrocarbons such as benzo (a) - pyrene which are readily absorbed and carried by soot. Falk[25] and his colleagues have studied the adsorption onto soot of carcinogenic hydrocarbons and their removal by such biological solutions as serum. They found a slow release of hydrocarbons to serum from soots of about 80 milimicrons ($m\mu$) diameter and a more rapid elution from larger ones. Using channel black of a size of 5 to 35 milimicrons ($m\mu$) Nau *et al*[26] found that benzo (a) - pyrene was so tightly bound that it could not be eluted by human serum or gastric juice. Thus soot is not only an irritant itself, and in sufficiently large amounts capable of increasing airway resistance, but it is also a carrier of other materials and capable of causing surface chemical reaction.

Sulfur Dioxide

The principal pollutant derived from combustion of sulfur-containing fuels (to a varying extent coal, fuel oil, and diesel oil contain sulfur) is sulfur dioxide. At about three parts per million this is detectable by odor though Dubrovskaya[27] from the Soviet Union reports an odor threshold of 0.6 parts per million. She further reports that the light sensitivity of the eye is increased by exposure to 0.2 parts per million.

The effect of sulfur dioxide in animals is to increase the resistance to airflow in and out of the lung. This effect has been potentiated by simultaneous exposure to certain types of particulates.[28] Animal experiments also indicate that sulfur dioxide interferes with the ciliary activity of the respiratory tract and thus no doubt interferes with clearance of inhaled materials.[29] It has also been shown that repeated exposures to sulfur dioxide cause a proliferation of mucous glands in animals and this produces a picture resembling chronic bronchitis in man.[30]

Experimental exposures in man have indicated that a detectable response in subjects can be first discerned at between one and five parts per million. The earliest change is in the airway resistance measured by the body plethysmograph.[31] Differences have been found in the sensitivity of human subjects. Pattle and Cullumbine[32] report that perhaps one person per hundred has bronchoconstriction when inhaling low concentrations of sulfur dioxide. This is sufficient to produce symptoms at concentrations as low as one part per million. We have confirmed this in studies using concentrations of 3, 5 and 9 parts per million for five minutes in a group of students. One student out of 10 showed striking decrease in maximal flow rate to all three concentrations. The others failed to react even to 9 parts per million.

Since sulfur dioxide pollution is troublesome frequently in the presence of fog droplets, the question has been raised as to whether the substance is oxidized to sulfur tri-oxide which would form sulfuric acid droplets. Johnstone[33] for example, has indicated the effect of manganese as a catalyst of this reaction and manganese is present in air polluted by industrial emissions. On a molar basis sulfuric acid produces from 4 to 20 times the physiological response in animals that sulfur dioxide produces. It has been said that the maximal oxidation observed is about 10 per cent. However, the air pollution disasters are thought by many to have been associated with a substantial oxidation of sulfur dioxide and to, in fact, have been largely due to sulfuric acid mist of a particularly potent size range.[34]

There is also suggestive evidence that sulfur dioxide exposures may influence the attack rate for asthma in varying communities and perhaps it is this type of pollution which is largely responsible for the so-called Tokyo-Yokohama asthma which has been most strikingly observed amongst American servicemen.[35] Japanese school children in polluted areas are reported to have diminished lung function and increased respiratory symptoms during the periods of high pollution.[36]

From experimental work, it is clear that the effects of sulfuric acid are greatly dependent upon the particle size of the droplet. Sufficiently large droplets impinge upon upper airways and appear to produce relatively little damage. Droplets of about a micron or less in diameter, however, may be carried by the inspiratory air stream deep enough into the lung so that they are not neutralized by the respiratory mucus. From animal studies and theoretical consideration there is reason to think that this would produce far more potent effects with a given weight of pollutants.

The recent work of Schuck, Doyle, Jones, Endow has indicated that very low concentrations of sulfur dioxide in the presence of photochemical air pollution in Los Angeles, are largely responsible for the particulate that interferes with visibility in Los Angeles.[11] Further studies have suggested that the particulate form is in fact a fine mist of sulfuric acid. These findings strongly suggest that even low concentrations of sulfur dioxide, such as 0.2 parts per million, can produce a substantial interference with visibility and a potentially hazardous sulfuric acid mist.

The Implication Of The Foregoing In The Care Of Patients

There is certainly enough known about the irritating effects of air pollutants to indicate the need for minimizing the inhalation of such pollutants by persons with chronic respiratory conditions such as asthma, bronchitis and emphysema. While such advice is easy to give, compliance with this depends more on action by the community than action by the individual. In any event during periods of fairly marked air pollution it is wise for such persons to be kept indoors, because pollutant levels are generally lower there than in the outdoor air.

Bronchodilator drugs are useful if there is much evidence of bronchospasm.

In Great Britain it has been observed that ammonia vapor will counteract to some extent the irritation from heavy smog and this has been used in preventing effects of the London type of air pollution.

But the major implication of what is now known about the health effects of air pollution is that breathing polluted air may be one of several causes of serious chronic lung diseases, that it may interfere with the important functions of the body and that in many circumstances it is a highly irritating and unpleasant experience. There is, therefore, every reason to feel that there are medical indications for preventing the pollution of the air overlying urban areas. Such prevention should be undertaken by industrial controls, by the most efficient use of fuels in home heating and motor transport, and by the avoidance of further pollution burdens from power plants in congested metropolitan areas. Much of the pollution in New York City can be traced to the use of fuels in power generating facilities. Present technology and engineering skills are adequate to permit locating these generating facilities at substantial distances from urban centers; for example, they could be located in Pennsylvania coal fields and through long distance high voltage transmission lines, provide power generation suitable for much of the metropolitan area of the Eastern seaboard. While there may be slight added expense to this, the cost of conventional power generation is likely to include a toll in human health, as well as substantial damage to property and interference with visibility and communication.

Summary And Conclusion

Community air pollution has been lethal in the disasters of Donora and London and possibly in the New York metropolitan area. Community air pollution is capable of causing acute illness and interference with important bodily function. In addition to its obvious irritating effects, some pollutants such as carbon monoxide produce a subtle impairment of the body's reserve for the transmission of oxygen to the living cell. Community air pollution is suspected as one of the causes of chronic lung disease and lung cancer. So far in the United States it has not been proven to produce these chronic conditions, but it has been shown to do so in England. Community air pollution can be very irritating, can interfere with visibility and produce property damage.

Medical judgment has much to do with the control of air pollution and the prevention of further pollution.

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Albert Einstein stated after Hiroshima that "Our world faces a crisis yet unperceived by those with the power to make great decisions for good or evil. The splitting of the atom has changed everything save our modes of thinking and thus we drift towards unparalleled catastrophe."

Environmental Cancer

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I. *Man And The Modern Industrial Artificial Environment*

Through the ages man has been engaged in a continuous struggle for existence with the numerous hostile animate and inanimate forces present in his natural environment. He had to meet also the repeated challenges for survival related to the periodic fundamental climatic changes and associated conditions occurring during his time on this earth. Those early branches of the species man which failed to develop gradually and successfully appropriate defensive adaptations become extinct.

In sharp contrast to these changes in the natural human environment extending over thousands of years and many generations and permitting the development of biologic adaptation reactions are the rather acute and fundamental alterations which modern man has been making in his environment during the last century by the addition of numerous and in part new inanimate physical and chemical agents. Many of them possess distinct and powerful biologic properties. A novel and continuously changing artificial environment has thereby been created which has been superimposed upon the natural one. In fact, during the last one hundred years all the external conditions under which man lives his life on this earth have been more completely revolutionized than during all the ages of recorded history which preceded.

Through these events not only the long established equilibrium between the various members of fauna and flora has been disturbed, but man is becoming also increasingly exposed to new, harmful, inanimate agents against which he neither possesses adequate natural defense mechanisms nor has he sufficient time to develop them through natural or artificial processes. Since human disease is essentially the result of an unsuccessful adaptation of man to the coexisting and partly competing animate and inanimate constituents of his environment, the development of industrialism and the associated artificial industrial environment has resulted in the appearance of new environmental diseases which never existed before, and which brought about distinct changes in the former disease panorama dominated by infectious diseases. This markedly modified modern disease panorama reflects both the beneficial as well as the harmful effects exerted by the impact of modern industrialism upon human health and longevity.

II. *Environmental Cancer Hazards And Carcinogens*

Of particular significance in this respect are the often insidious chronic and long-delayed functional and anatomical alterations of organs and tissues caused by prolonged exposures to small or even minute amounts of some of the new industry-related environmental agents. An outstanding segment of the health hazards of this type is represented by the various environmental cancers among which the occupational cancers form the prototypes. The growing number of new industry-related carcinogens and the increasing sources of exposure to these agents have intensified and diversified to a considerable degree during recent decades the total load of carcinogens to which the general population becomes exposed and which is related to contact with natural exogenous carcinogens (cosmic radiation, ionizing radiation from radioactive materials in the crust of the earth, solar radiation, arsenicals, soot), natural endogenous carcinogens, such as those associated with hormonal imbalances, as well as old and new artificial environmental carcinogens.

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1. ENVIRONMENTAL SOURCES OF CANCER HAZARDS

Among the different types of inanimate chemical and physical agents composing the modern industrial human environment, some may create cancer hazards to the general population. The following groups deserve critical analysis in this respect:

Environmental Sources of Exogenous Carcinogens

1. Dietary agents such as
    a) Food additives and contaminants including industrial chemically polluted drinking water, packing materials and chemicals naturally present in water and soil (arsenicals, selenium, radioactive substances)
    b) Chemicals generated during certain processing procedures of foodstuffs and during the preparation of foods from natural and artificial ingredients of foodstuffs
    c) Dietary deficiencies and imbalances
2. Household goods introduced into the average household, such as sanitary goods, over-the-counter drugs, household chemicals (detergents, cleaners, cleaning fluids, dyes, solvents, antirusting agents, pesticides, paints and paint removers, herbicides, contraceptives, cosmetics, etc.), economical poisons.
3. Domestic and general air pollutants (hydrocarbons formed during the incomplete combustion of carbonaceous fuels, including gasoline and diesel engine exhausts, oxidation products of volatilized gasoline; arsenicals; chromates used as antirusting agents; radioactive substances; industrial effluents)
4. Occupational agents of various types
5. Habits and customs of certain kinds
6. Medicinal chemical agents and apparatus generating ionizing and non-ionizing radiations (prescription items)
7. Chemical and physical agents of the natural environment and animate, infectious agents

Environmental cancer hazards are becoming rapidly major public health problems for the following reasons: I. A constantly rising number of persons is afflicted by and dying from cancers of known and unknown origin. II. Environmental cancers being practically the only cancers of known etiology are on this account also the only cancers for which rational and effective primary control measures can be instituted. The relative importance of the various recognized, suspected and potential environmental cancer hazards from a public health viewpoint may roughly be assessed according to the following principles:

A. Agents which enter the general human environment or every home and, therefore, come in contact with large parts of the population either frequently or even daily and over prolonged periods of time which sometimes may encompass the entire life, deserve the first and most serious consideration. Consumer goods and general environmental pollutants belong to the group. The carcinogenic effects from these agents are least readily ascertained and cancer hazards produced by them are most difficultly controlled.

B. Occupational carcinogens to which large worker groups become exposed and which not infrequently are of high carcinogenic potency form the second group of environmental carcinogens occupying a somewhat lower position than the first mentioned one in this scale.

C. Carcinogenic agents which are dispensed as drugs by prescription only, which are associated with certain diagnostic or therapeutic procedures, or with which only small worker groups have effective contact make up the last and least important group of environmental carcinogens.

The growing pollution of the human environment with industry-related carcinogens is strikingly reflected by the fact that not only the great majority of the at present known environmental carcinogens, carcinogenic exposures, and cancers were discovered during the last 75 years, but this development also has obtained increasing momentum during the last two decades. In fact, an increasing amount of epidemiologic, clinical, pathologic, and experimental evidence acquired during this period supports the view that many human cancers are directly or indirectly related to contacts with specific physical and chemical agents to which the human population becomes exposed for occupational, medicinal, dietary, habitual, or other environmental reasons. The data on hand strongly indicate that the majority of cancers involving the skin, alimentary tract, respiratory system, and liver are of exogenous causation and that an appreciable fraction of the cancers of the bladder, bones and blood forming organs have a similar origin.

Although the total number of environmental and, particularly, occupational human cancers observed in circumscribed population groups and made a matter of public record is relatively small, there can be no doubt that the actual number of such cancers which have occurred in these restricted populations is considerably higher because many have not been reported and others have not been recognized as being of environmental origin (Table I a). The great bulk of worker groups having in some form, contact with the known occupational carcinogens, moreover, has never been surveyed for the presence and incidence of occupational cancers. Most epidemiologists, moreover, have adopted the principle of admitting the presence of an occupational cancer hazard only if the

TABLE I

INDUSTRY-RELATED ENVIRONMENTAL CARCINOGENS, THEIR ROUTE OF EXPOSURE AND THEIR TARGET ORGANS

GENERAL TYPE	SPECIFIC TYPE	ROUTE OF EXPOSURE	TARGET ORGAN
Chemical Carcinogens Organic Chemicals Aromatic, Polycyclic, Heterocyclic	Benzol	Cutaneous Respiratory	Blood Forming Organs (Leukemia, Lymphosarcoma)
	Beta-Naphthylamine Benzidine 4-Aminodiphenyl	Respiratory Cutaneous Alimentary	Urogenous Organs (Bladder, Ureter, Kidney)
	Auramine		Lung? Intestine?
	Coal Tar, Pitch, Asphalt, Tar Oil	Cutaneous	Skin
	Creosote Oil, Anthracene Oil, Lamp Black, Lignite, Tar and Paraffin Oil	Respiratory	Lung
	Synthetic Hydrogenated Coal Oil and Tar (Bergius)	Cutaneous	Skin
	Shale Oil and Paraffin Oil	Cutaneous	Skin
		Respiratory	Larynx
	Petroleum Fuel, Oil, Diesel Oil, Lubricating Oil and	Cutaneous	Skin
	Grease, Cutting Oil, Carbon Black, Asphalt, Tar, Coke, Crude Paraffin Oil	Respiratory	Lung
Aliphatic	Isopropyl Oil	Respiratory	Nasal Sinus Larynx Lung
	Mustard Gas	Respiratory	Lung Larynx
Chemical Carcinogens Inorganic Chemicals	Arsenic	Cutaneous	Skin
		Ingestive	Liver
		Respiratory	Lung
	Nickel	Respiratory	Nasal Cavity Nasal Sinus Lung
	Chromium	Respiratory	Lung
	Asbestos	Respiratory	Lung
Physical Carcinogens Nonionizing Radiation	Ultraviolet Radiation	Cutaneous	Skin
	X-Radiation	Cutaneous	Skin
		Trans-cutaneous	Connective Tissue Bone Blood Forming Organs
	Radioactive Radiation (Alpha-, Beta- and Gamma-Radiation	Cutaneous	Skin
		Trans-cutaneous	Connective Tissue Blood Forming Organs
		Respiratory	Nasal Sinus Lung
		Ingestive	Bone
Parasitic Carcinogens	Schistosoma hematobium	Cutaneous	Bladder

TABLE II

NON-OCCUPATIONAL ENVIRONMENTAL CANCER HAZARDS

	CONTACT	TARGET ORGAN
1. HABITS		
Sun Tanning	Cutaneous	Skin
Betel Nut Quid (Orient)	Oral	Oral Cavity, Lip
Khaini Quid (Orient)	Oral	Lower Lip, Gingiva
Chutta (Soot, Burns) (Smoking with lighted end in mouth) (Orient, Central and South America)	Oral	Oral Cavity, Palate
Dhoti (India)	Cutaneous	Skin
Tobacco Chewing	Oral	Oral Cavity
Tobacco Smoking	Respiratory	Oral Cavity, Larynx, Lung
2. CUSTOMS		
Non-circumcision (Smegma?)	Cutaneous	Penis Uterine Cervix?
Kang, Kairo, Kangri (Individual Heating Devices) (China, Japan, India) (Soot, Burns)	Cutaneous	Skin
3. DIETARY FACTORS		
Proteinic & Vitaminic Malnutrition (Africa; So. Asia)		Liver Male Breast?
(Northern Sweden & Finland)		Hypopharynx
Red Pepper Alkaloids? Chilies? (Africa)		Liver?
Iodine Deficiency (Endemic Goiter Regions)		Thyroid
4. INFECTIONS		
Schistosoma Hematobium (Africa; Asia)	Oral Cutaneous	Bladder
Clonorchis sinesis (Asia)	Oral	Liver?
5. AIR POLLUTANTS		
Soot, Automobile & Diesel Engine Exhausts	Respiratory	Lung?
Arsenicals		
Radioactive Matter		
6. MEDICINAL AGENTS	CONTACT	TARGET ORGAN
Ultraviolet Radiation	Cutaneous	Skin
Ionizing Radiation	Cutaneous	Skin
	Transcutaneous	Bone, Liver, Larynx, Nasal Sinus, Uterus? Thyroid?
	Oral	Connective Tissue
	Parenteral	Internal Organs, Myeloid Tissue
Coal Tar	Cutaneous	Skin
Arsenicals	Oral	Skin, lung? Liver

incidence rate of cancers in the population studied is significantly higher than the standard figures for the general population. This type of assessment is based on the fallacious concept that there exists a "natural" or "intrinsic" liability of man to acquire cancers. The fact is that man has as little a "normal" liability to cancer as he runs a "normal" risk of developing tuberculosis, syphilis, plague or any other infectious disease. The absolute incidence rate of a particular cancer among a given population group does not furnish any information as to the cause or causes responsible for the occurrence of this cancer nor does it provide any valid data concerning the possible existence of an "excessive" risk from some special environmental carcinogen because of the polyetiologic origin of human cancers.

2. ENVIRONMENTAL CARCINOGENIC SPECTRUM

The following tables (Tables I, II, and III) summarize the data available on the various established, suspected, and potential carcinogenic agents which have caused cancers or may cause cancers in different organs and tissues of individuals upon adequate exposure through one or several routes (cutaneous, subcutaneous, respiratory, ingestive, transcutaneous, transplacental, intravenous, parenteral).

The first group encompasses the recognized and strongly suspected, industry-related carcinogens which account for the great majority of environmental cancers observed in the industralized countries of the Western World, and related to specific occupational activities and industrial agents (Table I). The second group (Table III) lists in addition to cancers attributable to industry-related agents used in the general economy by large consumer groups or released as wastes from industrial establishments and motors, a number of miscellaneous and usually ill defined agents and exposure conditions which possess causal associations to cancers of various organs found either in certain restricted population groups and related to specific habits, customs, dietary inadequacies, and infec-

TABLE III

POTENTIAL ENVIRONMENTAL HUMAN CARCINOGENS

AGENT	SITE OF TUMOR	TYPE OF EXPOSURE	SPECIES	TYPES OF HUMAN CONTACTS
Estrogens Natural Synthetic	Breast Lymph Nodes Uterus Hypophysis	Parenteral Cutaneous Oral	Mouse Rat Rabbit Guinea Pig	Manufacture Dietary Additive Cosmetic Ingredient
Carbon tetrachloride	Liver	Oral	Mouse	Industrial Solvent Degreasing Agent Dry Cleaning Agent Fire Extinguishing Agent Manufacture Production of Preon Grain Fumigant Extractive of Oils
Chloroform	Liver	Oral	Parenteral Mouse	Manufacture Anesthetic Solvent and Extractive of Oils, Resins, Rubber, Waxes, Iodine, Alkaloids Ingredient of Lacquer, Floor Polish, Cleaning Fluid Production of Artificial Silk, Plastics
DDT (a,a-Bis (p-chlorophenyl-1,1,1-trichloroethane)	Liver	Oral	Rat	Manufacture Insecticide Food Contaminant
Tannic Acid	Liver	Parenteral	Rat	Ingredient of Foodstuffs (fruits, wine, coffee, and tea) Medicinal Agent Tanning Agent
Thiourea and Derivatives (Thioacetamide)	Liver Thyroid	Oral	Rat	Citrus Fruit Preservatives Medicinal Agent
p-Phenetylurea (Dulcin)	Liver	Oral	Rat	Manufacture Sweetening Agent
8-Hydroxyquinoline	Bladder Uterus	Implantation into Bladder into Vagina	Mouse Rat	Food Preservative Contraceptive Rectal Suppository Adhesive Ingredient for Paraffinized food Containers Fluorescent X-Ray Screens
Diethylene Glycol	Bladder	Oral	Rat	Antifreeze Intermediate in Explosive Manufacturer Softener of Lacquer Inks, Wood Stains, Glue, Textile, Humectant (Tobacco)
Methylated Naphthalenes	Skin	Cutaneous	Mouse	Vehicle of Insecticides
Bergius Coal Oils & Tars	Skin Subcutaneous Tissues	Cutaneous Parenteral	Mouse Rat	Manufacture Fuel Lubricants Plastic Production Carbochemical

Table III (Continued)

AGENT	SITE OF TUMOR	TYPE OF EXPOSURE	SPECIES	TYPES OF HUMAN CONTACTS
Fischer-Tropsch Coal Oils, Tars, Waxes, Greases	Liver	Cutaneous Parenteral	Mouse	Manufacture Fuel Lubricant Carbochemical
Vegetable Oils (Polymerized & Oxidized)	Subcutaneous	Parenteral	Rat	Margarine Emulsifier
Safrol	Liver	Oral	Rat	Flavoring Agent
Cellophane Polyethylene Polyamide (Nylon) Bakelite Teflon Polymethyl Methacrylate	Subcutaneous Tissue or retroperitoneal Tissue	Parenteral	Rat Mouse	Film, Fiber, Plastic-Industrial Manufacture and uses Wrapping Material Medicinal Agent
Polyethyl Silicone		Parenteral	Rat	Silica Rubber
Beta-Propiolactone	Subcutaneous Tissue, Skin	Parenteral Cutaneous	Rat Mouse	Plastics, Polymerization Terminator, Viricide for Vaccines, Human Tissue. Implants and Plasma
Trypan Blue	Lymphoid Tissue	Parenteral	Rat	Vital Stain
Oil Orange E.	Liver	Oral	Mice	Food Dye
Oil Yellow HA	Liver	Oral	Mice	Food Dye
Oil Orange TX	Subcutaneous Tissue Colon	Parenteral	Mice	Food Dye
Yellow AB & OB Fast Green PCF Patentblue AE Azurblue VK Guinea Green B Sudan I Sudan 7B Sudan Brown NR Orange SS Thiazin Brown Black 5410				
Beryllium	Bone Lung	Parenteral Respiratory	Rabbit Rat	Metal Alloy, X-Ray Tube, Phosphor Manufacture Refractory Vessels, Atomic Energy Production
Selenium	Liver Thyroid	Oral	Rat	Soil Contaminant Coloring matter of Glass, Ceramics, Paint, Rubber Metal Alloys Rubber Accelerator Photoelectric Apparatus Decolorizer Fireproofing Agent Medicinal Agent
Cobalt	Subcutaneous Tissue	Parenteral	Rat	Metal Alloys & Plating Coloring Matter of Glass, Ceramics, Paint, Rubber Medicinal Agent
Light Green SF Brilliant Blue FCF Fast Green FCF	Subcutaneous Tissue	Parenteral	Rat	Textile Dyes Food & Cosmetic Dyes

TABLE III (Continued)

AGENT	SITE OF TUMOR	TYPE OF EXPOSURE	SPECIES	TYPES OF HUMAN CONTACTS
Butter Yellow	Liver	Oral	Mouse Rat	Flare Color Food Dye (Orient) Gasoline Dye
Polyvinyl Pyrrolidone	Liver, Lymph Node Uterus, Subcutaneous Tissue	Parenteral	Rat	Plasma Extender Hair Lacquer Medicinal Vehicle
Carboxymethyl Cellulose	Subcutaneous Tissue	Parenteral	Rat	Food Additive Resin
Nitrosamines	Liver, Lung, Kidney, Bladder, Esophagus	Parenteral	Rat Guinea Pig Hamster	Industrial-Chemical

tions. Cancers of this variety are particularly frequent among people of some oriental countries. A noteworthy feature of this group of carcinogens is the fact that they are not all synthetic products but in part natural ones.

This observation is of importance, since it demonstrates that there is not invariably an innate "goodness" in the products of nature, as some people are inclined to believe, but that the chemical activities of nature like those of men produce both beneficial as well as harmful substances and that the products of both deserve critical consideration from the viewpoint of possible environmental carcinogenesis.

In the third list (Table III) of so-called "potential human carcinogens" such agents are recorded with which often large parts of the population have frequent and intense contact for various reasons and for which at present no valid evidence exists that they are carcinogenic to man, but which definitely are carcinogenic to some species of animals when administered by one or several routes. A potential human carcinogen therefore is a substance which has convincingly been demonstrated to be carcinogenic to animals, and though not yet shown to act as such in man, must be suspected of having a similar affect in man. This conclusion finds sound support in the fact that primary observations on the carcinogenic action of various specific chemical and physical agents acting on man for occupational reasons have subsequently been confirmed in most cases by corresponding results obtained in experimental animals (coal tar, pitch, creosote oil, anthracene oil, soot, oils, shale oils, lignite oils, various similar petroleum derivatives, such as fuel oils, tars, crude paraffin oils, and cutting oils, benzol, betanaphthylamine, benzidine, 4-aminodiphenyl, nickel, ultraviolet radiation, ionizing radiations). Although it is not likely that all of the potential human carcinogens listed may ultimately be found to be actual human carcinogens because of the known species specificity of carcinogens, there can be little doubt that such an evidence will at some future time become available for some and perhaps many of them.

It has been said that modern mankind is living in a "sea of carcinogens," if these observations, implications and concepts are correct, and that for this reason deaths from cancer should be much more frequent than they actually are. There can be little doubt that we are indeed living in an environment containing not only numerous and diverse carcinogens, but that we have lived also for thousands of years and are still living in a sea of pathogenic microorganisms, over which only recently some measure of control has been achieved. The strikingly irregular epidemiologic scatter pattern of cancers among the general population viewed against the background of environmental carcinogenic pollution suggests that exposures to environmental carcinogens sustained in the past by most members of the general population were usually of relatively weak nature and therefore often were ineffective by failing to overcome the natural defensive forces of the body or were not sufficiently powerful to become manifest during the normal life span of the majority of the exposed individuals. The evidence presented, on the other hand, makes it uncertain whether this situation will continue to exist during the coming years, and whether it may not be possible that epidemic-like conditions may arise as the result of an inadequately controlled pollution of the human environment with industry-related carcinogens of potent nature, great stability and wide distribution. The potential carcinogenic effects of this development on modern man are accentuated by the fact that through the marked lengthening of the average human life span achieved in recent decades, an increasing number of individuals has not only contact for a longer period of time than previously to these agents but also lives sufficiently long for the elapse of the latent period of these cancers. Moreover, the increasing release of carcinogenic industrial and industry-related wastes into the human environment (air, water, soil) deserves consideration in this connection. The rapidly growing contact of the general population with consumer goods containing carcinogenic ingredients or impurities adds another source of cancer hazards which must be considered as potentially especially dangerous, since the delayed carcinogenic effects which may ensue from such exposures are very difficult to ascertain. Through such developments of recent years environmental cancer hazards formerly restricted to occupational contacts sustained by small groups of individuals have become or may become actual or potential cancer hazards involving major portions of the general population.

Conclusions

Observations of the last 100 years demonstrate the causal importance of natural and man-made physical and chemical agents in the production of cancer in man.

The evidence on hand strongly suggests that a major fraction of all cancers are attributable to the action of these agents, although definite proof of this thesis is at present available for only a rather small portion, especially those occurring among circumscribed occupational groups.

While the information already existing on an exogenous carcinogenesis of human cancer as related to specific and recognized chemical and physical agents permits the limited application of preventive measures, it is likely that with increasing appreciation of such associations and growing factual knowledge on environmental carcinogens, their sources and their types of exposures an effective prevention program of cancer may soon become a practically feasible proposition.

The various measures adopted during recent years for the control of cancer hazards related to exposures to ionizing radiations, air pollutants and additives and contaminants of foodstuffs and cosmetics, represent the guidepost for such future developments.

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> The Master is not the one whose teaching is unalterably fixed as dogma, but the one whose teaching has given the start to further development to deeper understanding and to a life in progress.
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> —A. Dietrich, cited by J. B. Herrick in *A Short History of Cardiology,* Charles C. Thomas, Springfield, Illinois, 1842.

Inhalation Of Tobacco Smoke

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The problem of air contamination must have been with us for hundreds of millennia; and during much of that period it must have had an appreciable impact upon the mortality of mammals. This is the most reasonable explanation of the evolution of the intricate defense system now found in man and other mammals.

The first line of defense is in the nasal passages where most of the large particles and some of the small particles are filtered out of contaminated air before it reaches the trachea. This mechanism is particularly well developed in mice, rats, and other small rodents which breathe air from close to the ground where, under some conditions, it is heavily laden with dust.

The second line of defense is in the tracheo-bronchial tree. Glands in the walls of the tubes excrete a sticky fluid onto the epithelium; and this is supplemented by excretions from goblet cells in the epithelium. The epithelium normally consists of a surface layer of ciliated columnar cells (interspersed with goblet cells) and one or two rows of basal cells lying in between the columnar cells and the tunica propria. The action of the cilia moves the surface fluid up and out of the tracheo-bronchial tree. When contaminated air is drawn into the tracheo-bronchial tree, much of the particulate matter precipitates onto the epithelium and is trapped by the fluid. Thus, together with the fluid, the particulate matter is removed from the lungs.

Alveolar phagocytes constitute the third line of defense. They take up foreign matter which reaches the alveolar spaces and then migrate with it to the bronchial tubes where they disintegrate. The discharge material is removed by the mechanism described above.

This set of mechanisms ordinarily provides an efficient defense of the lungs against particulate air contaminants, especially contaminants composed of particles of relatively large size and biologically inert. In other words, it provides a high degree of protection against the types of dusts which were the major air contaminants during the long course of evolution. However, it provides less protection against particles of such small size that many of them remain suspended in the air until it reaches the alveolar septa; and it provides little or no protection against gaseous impurities in the air. Furthermore, it may provide relatively ineffectual protection against particles composed of materials which are highly active chemically.

Unfortunately, civilized man now contaminates his air with impurities of types not present in the air during most of the period of the evolution of his species. These new types include gases; particles of extremely small size; particles composed of materials which are highly active chemically; and, in certain industrial and mining situations, extremely heavy concentrations of harmful dusts and vapors. For convenience, we may classify these air contaminants into three groups: a) occupational exposure to dusts, fumes, and vapors, b) general air pollution in cities and industrial areas, and c) tobacco smoke. This paper is concerned with the third type (i.e. tobacco smoke); but the other two types cannot be disregarded in a logical discussion of the problem.

The effects of certain occupational exposures are so well known that I mention them only as an illustration of what can result from breathing contaminated air. Some chemically active industrial fumes, gases, and dusts can damage lung tissue and produce the symptoms characteristic of bronchitis. Other dusts produce pneumoconiosis involving his-

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tologic changes characteristic of pulmonary fibrosis and emphysema; and persons suffering from the disease are highly susceptible to infectious diseases of the lungs. Several types of dusts to which some industrial workers and miners are exposed are known to be capable of producing bronchogenic epidermoid and undifferentiated carcinoma (e.g. dust containing radioactive material, chromates, or nickel).[1] These dusts apparently do not produce bronchrogenic adenocarcinoma.

General air pollution can reach such levels as to produce a sudden and dramatic increase in death rates. This has been demonstrated in several unfortunate episodes in London, the Meuse Valley, and Donora, Pennsylvania.[2-4] It is of interest that, in these episodes, there was an increase in death rates from many different diseases, not just an increase in death rates attributed exclusively to lung disease. The possible effects of air pollution at the levels currently occurring in American cities are discussed in other papers in this volume.

Since much of the general air pollution derives from the combustion of organic material, it is not surprising that it contains many of the chemical substances found in tobacco smoke. These include carbon monoxide as well as many different organic and inorganic compounds, some of which are toxic and some of which are highly irritating to tissues. Furthermore, both general air pollution and tobacco smoke contain small quantities of several known carcinogenic compounds such as 3-4 benzpyrene.[5-8] Thus if a person who lives in an urban area inhales tobacco smoke, he is exposed to the same substances from two different sources; and he may have a third source of exposure in his occupation (e.g. a garage worker who lives in a city and inhales cigarette smoke). Tobacco smoke is unique in that it contains a high concentration of nicotine and related alkaloids.

Exposure to cigarette smoke differs from exposure to other air contaminants in one important respect. Human beings usually breathe through their noses; and, when they do so, much of the particulate matter in the air is removed in their nasal passages before the air reaches their lungs. Cigarette smokers, on the other hand, deliberately by-pass the filter which nature has provided for them; they take the smoke through their mouths directly into their lungs. If they inhale deeply, most of the particulate matter (of which tobacco smoke is mainly composed) is deposited on the epithelium of their bronchial tubes and in the alveoli of their lungs.

Most cigarette smokers inhale the smoke to at least a moderate degree, and heavy cigarette smokers usually inhale the smoke deeply.[9, 10] In contrast, pipe and cigar smokers usually avoid inhaling the smoke. Female cigarette smokers usually inhale the smoke less deeply than do male cigarette smokers. Furthermore, cigarette smoking became a very popular habit at an earlier date among men than among women. Thus the typical male cigarette smoker now over the age of 40 has smoked for many more years and has inhaled far more smoke than the typical female smoker now over the age of 40. When mice or rats are experimentally exposed to cigarette smoke, they draw in the smoke through the efficient filter in their nasal passages. Therefore, even if they breathe in smoke of the same concentration, the lungs of mice and rats are less exposed to the particulate matter in cigarette smoke than are the lungs of human cigarette smokers.

Bronchial Tubes

Chronic bronchitis, a disease usually identified by a chronic, productive cough, was common in London in the days of William Harvey and has been so ever since. Harvey attributed this to air pollution from the innumerable chimney pots of London which, together with the London fog, produced smog even in his time.[11] That was in the early seventeenth century before the advent of the cigarette. Our British friends are now subjected to heavier smog and in addition consume great quantities of cigarettes. While chronic bronchitis is seldom recorded on a death certificate in this country, it is a common cause of death in Great Britain.

Clinical studies both in Great Britain and in this country have shown a high degree of association between cigarette smoking and chronic bronchitis.[12-14] That is to say, the disease is more common among cigarette smokers than among non-smokers; and the prevalence rate increases with amount of cigarette smoking.

We have made a study of smoking habits in relation to coughing, shortness of breath and other physical complaints as reported on questionnaires filled out by 43,068 men and women.[15] In both sexes, a high association was found between cigarette smoking and these complaints. For example, among men in age group 50 to 59, the following per cent of subjects reported having a moderate or severe cough: 5.8 per cent of men who never smoked; 5.9 per cent of ex-smokers; 7.8 per cent of cigar smokers; 11.0 per cent of men who smoked 1 to 9 cigarettes a day; 24.0 per cent of men who smoked about 20 cigarettes a day; and 41.5 per cent of men who smoked 40 or more cigarettes a day. Among people who smoked the same number of cigarettes per day, those who inhaled the most deeply reported the most coughing. Those who smoked cigarettes with a low nicotine and tar content reported somewhat less coughing than those who smoked cigarettes with a high nicotine and tar content. Shortness of breath showed almost as much association with cigarette smoking as did coughing. Complaints of loss of appetite, loss of weight, and "fatigue easily" were also highly associated with cigarette smoking.

Hilding,[16] working with cows and Kotin,[17] working with mice, have shown experimentally that exposure to tobacco smoke inhibits the action of cilia in the bronchial tubes of these animals. Kotin has also shown that exposure to certain general air pollutants has the same effect.[18] Since ciliary action plays an important role in the defense mechanism of the lungs, it would seem that inhibition of the cilia would make the lungs more vulnerable to the potential effects of any type of air pollution either from the same source or from some other source.

Auerbach, Stout, Hammond, and Garfinkel have made a series of histologic studies of bronchial epithelium and the walls of bronchial tubes in relation to smoking habits, residence history (i.e. urban or rural), age and sex.[19-22] Altogether, Auerbach examined approximately 80,000 tissue sections taken at autopsy from the tracheo-bronchial trees of over 1,200 men, women and children. In each of the studies, the sections were arranged in random order and were identified only by serial numbers which gave the reader no clue as to their identity. Glands in the walls of the tubes were examined for evidence of increased activity (i.e. hyperplasia together with distended goblet cells) and the epithelium was examined for evidence of any of the following types of histologic changes: a) hyperplasia (i.e. more than two rows of cells between the tunica propria and the surface row of ciliated columnar cells), b) loss of cilia, and c) the occurrence of cells with atypical nuclei (i.e. nuclei having appearance of the nuclei of cancer cells). An area of epithelium with none of these changes was considerel to be normal while an area of epithelium with any one or more of these changes was considered to be a lesion. Many of the epithelial lesions showed two or more types of change; and in many sections two or more different types of lesions were found.

Every one of the histologic changes mentioned above was found to be highly related to cigarette smoking. Men and women who had never smoked had the least changes; pipe and cigar smokers had somewhat more changes than did men who had never smoked; cigarette smokers had the most changes; and the degree of the changes increased greatly with amount of cigarette smoking. Ex-cigarette smokers had less changes than did men who continued to smoke cigarettes regularly.

Among cigarette smokers, the degree of the changes (particularly changes involving cells with atypical nuclei) increased considerably with advancing age.

Among cigarette smokers who were of the same ages and who had smoked the same number of cigarettes per day, men had somewhat more lesions in their bronchial epithelium than did women. This difference was most marked in respect to the occurrence of cells with atypical nuclei.

Among persons who had never smoked, there was no increase in epithelial lesions with advancing age. About as many changes were found in infants and small children as were found in female non-smokers over 80 years old who had lived all of their lives in rural areas presumably free of general air pollution.

Somewhat more hyperplasia and somewhat more loss of cilia was found in female non-smokers from urban areas (presumably with exposure to general air polution) than in female non-smokers from rural areas (presumably free from exposure to general air pollution). However, very few cells with atypical nuclei were found in these non-smokers whether from rural areas or from urban areas.

The association between cigarette smoking and changes in the bronchial tubes (i.e. inhibition of ciliary action, increased activity of the glands, and histologic changes in the epithelium) is sufficient to account for the clinical findings of a strong association between cigarette smoking and chronic bronchitis (i.e. chronic productive cough). The findings of somewhat more hyperplasia and somewhat more loss of cilia in urban non-smokers than in rural non-smokers suggests that Harvey was correct in his assumption that exposure to heavy air pollution in London accounted for the high rate of chronic bronchitis in that city. While chronic bronchitis causes death only in extremely advanced cases, it certainly impairs pulmonary function and there is reason to believe that it often leads to secondary changes in the lung parenchyma. Furthermore, there is reason to suppose that serious impairment of pulmonary function increases the case fatality rate of persons suffering from serious diseases of other organs. This is strongly suggested by the increase which occurred in general mortality during episodes of extreme smog in London, the Meuse Valley, and Donora.

Loss of cilia, even more than inhibition of ciliary action, impairs the mechanism which ordinarily removes foreign matter from the bronchial tubes. Thus these effects of inhalation of cigarette smoke and some general air pollutants reduce the protection of bronchial epithelium from particles of carcinogenic material which may be inhaled with tobacco smoke, general air pollution, or occupational exposure to certain dusts.

In our studies of bronchial epithelium, we occasionally found a few cells with atypical nuclei in non-smokers; but, with one exception, in non-smokers we never found a lesion composed entirely of cells with atypical nuclei. The one exception was an asbestos worker who smoked only occasionally and who died of lung cancer. (There is considerable evidence that prolonged and heavy exposure to asbestos dust can produce lung cancer.)

Epithelial lesions composed entirely of cells with atypical nuclei (and lacking cilia) were highly associated with cigarette smoking; increased greatly with amount of smoking; and, in cigarette smokers, increased with age. They were found far less often in ex-cigarette smokers who had given up the habit for some years than in men who continued to smoke cigarettes. The location of these lesions is of interest. They were found in considerable numbers in the bronchial epithelium of most heavy cigarette smokers but were seldom found in the epithelium of the trachea. Within the bronchial tree, they were found most often at points of bifurcation where particulate matter is most apt to precipitate from contaminated air.

Except for lack of penetration of the basement membrane, most of the lesions composed entirely of atypical cells were indistinguishable from small invasive, bronchogenic carcinomas. We are of the opinion that bronchogenic carcinoma originates from lesions of this type. The situation appears to be parallel to the development of invasive carcinoma of the cervix uteri from lesions composed entirely of cells with atypical nuclei in the epithelium of the cervix uteri (i.e. lesions commonly called carcinoma-in-situ) ..

Inhalation Experiments

All of the types of bronchial epithelial lesions (short of invasive cancer) which we found to be associated with cigarette smoking in human beings have been produced experimentally by exposing mice to cigarette smoke.[23] Kotin has also produced such lesions by exposing mice to a synthetic smog composed of particulate materials found in some types of general air pollution; and some of his animals developed bronchogenic carcinoma.[24] Vorwald has produced bronchogenic carcinoma in rats by exposing them to beryllium dust, a substance which produces a violent effect upon the lungs.[25] No one has yet reported the production of epidermoid or undifferentiated bronchogenic carcinoma in rodents by exposing them to cigarette smoke.

There has been so much interest in smoking in relation to lung cancer that there has been a tendency to disregard other findings as well as difficulties encountered in inhalation experiments with animals.

When carcinogenic chemicals are applied to animals, non-neoplastic tissue changes may occur rather quickly but carcinoma does not appear until after a long period of exposure. The proportion of animals eventually developing the disease depends upon the potency of the agent, the quantity applied, the duration of exposure, and the susceptibility of the animals. (Different species and different strains of the same species vary greatly in susceptibility). Therefore, three things are obvious: a) carcinoma does not occur if the animals die before sufficient time has elapsed for the development of carcinoma, b) carcinoma is unlikely to occur if the dose is below a certain critical amount, and c) carcinoma is unlikely to develop if the animals are highly resistant to the disease. We have no knowledge of the relative susceptibility of rodents and man to epidermoid bronchogenic carcinoma under conditions where the bronchial epithelium is exposed to the same dosage of an agent for the same length of time. However, we do have some evidence concerning the other two factors mentioned above.

A major difficulty with exposing the bronchial epithelium of rodents to cigarette smoke is that, unlike human cigarette smokers, rodents draw the smoke through their noses where much of the particulate matter is removed. Furthermore, I have found that unless they are held down, many mice are intelligent enough to find a location in the exposure chamber where there is a minimum amount of smoke. However, it is possible to design an experiment such that mice are forced to inhale cigarette smoke administered in puffs of approximately the same duration, spaced in about the same way, and of the same concentration as are customarily taken by human cigarette smokers. Of course, even under these conditions we are faced with the problem of inhalation through the nose rather than inhalation through the mouth. Thus the experimental conditions more nearly resemble the situation of a nonsmoker sitting in a small room with several cigarette smokers than the situation of one of the smokers. Nevertheless, the results are interesting.

When I first tried this experiment, most of my mice went into convulsions and died within a few minutes, presumably due to the acute toxic effects of nicotine. With slightly lower concentrations of smoke, the mice lived longer but many died, possibly due to carbon monoxide effects or nicotine effects. With still lower doses, I could keep the mice alive; but it appeared to me that they were inhaling a much lower concentration of smoke than does the typical human cigarette smoker.

Essenberg was one of the first investigators to report the results of a cigarette smoke inhalation experiment.[26] His apparatus was such that for 3 or 4 minutes out of each hour for twelve hours a day, smoke from one cigarette was drawn through a chamber, two cubic feet in capacity. Fresh air was drawn through the chamber at all other times. Thirty-six mice were placed in the exposure chamber and 36 mice were placed in a control chamber without exposure to cigarette smoke. The mice were of a strain known to be highly susceptible to lung tumors. The experiment was continued for one year at the end of which time the surviving mice were sacrificed and examined for evidence of lung tumors.

Of the 36 control mice, 4 died before the end of the experiment and 19 of those which survived were found to have lung tumors; while the 36 exposed mice, 13 died before the end of the experiment and 21 of the survivors were found to have lung tumors. Thus 23 (63.9 per cent) of the control mice had serious difficulties (i.e. death or lung tumors) while 34 (94.4 per cent) of the exposed mice experienced similar difficulties. Furthermore, weight records showed that the exposed mice grew more slowly and failed by a large margin to attain the weight of the controls.

Because the mice were of a strain having a high incidence rate of "spontaneous" lung tumors, and because of the nature of the tumors (adenomas), there is some question as to whether the results of Essenberg's experiment have any bearing on the subject of lung cancer in man. However, his experiment did show that a group of mice not exposed to cigarette smoke remained healthier than a group of mice briefly exposed to cigarette smoke twelve times a day.

Passey, Elson, and Lewis became interested in weight loss produced by exposure to cigarette smoke.[27] They report:

> "Since animals (mice, rats and golden hamsters) exposed for long periods to cigarette smoke show a consistent loss of weight coupled with a diminished food intake, experiments have been in progress to elucidate this phenomenon, which is often remarked upon as being a common experience in man. It was established that the weight loss which takes place is a real one and not due solely to the restrictions in food intake which smoke induces in the animals, because control animals, not exposed to smoke, continued to grow in weight at a faster rate, when their diet was strictly limited to that which the smoke-exposed animals actually ate. This suggested that the smoke-exposed animal utilizes its food in some manner different from the normal."

Passey has reported observing "certain consistent gross changes in the lungs and in the intrathoracic vascular system in animals exposed to cigarette smoke."[28] He says in part:

> "There can be seen, as was to be expected from pharmacological experience, evidence of marked constrictions of the peripheral vascular system in general, in animals exposed to cigarette smoke. The lungs, however, are notable in the way in which these constrictive effects are shown up by this method, and it appears that the whole of the respiratory tract in the heavy smoker can be subject to considerable and lasting changes of a generalized nature."

Lung Parenchyma

Auerbach, Stout, Hammond, and Garfinkel have recently reported preliminary findings in an extensive study of smoking habits in relation to histologic changes in the lung parenchyma of human beings.[29] Tissue sections, usually consisting of a wedge-shaped slice extending from the pleura inward about two centimeters, were taken at autopsy from the lungs of 242 subjects. The principal changes studied were fibrosis (i.e. thickening of alveolar septa), rupturing of alveolar septa, and thickening of walls of arterioles and small arteries.

All of these types of change were found to be highly associated with cigarette smoking. Non-smokers showed only slight if any changes of these types; current pipe and cigar smokers as well as ex-cigarette smokers showed more such changes than non-smokers; cigarette smokers showed the greatest changes; and the degree of the changes increased greatly with amount of cigarette smoking.

We were particularly impressed by evidence of impairment of the vascular system of the lungs of cigarette smokers, this being very pronounced in men beyond middle age who were in the habit of smoking a pack or more of cigarettes a day. Due to rupturing of alveolar septa, there was considerable loss of capillaries; and due to thickening of the walls of arterioles and small arteries the lumen of these vessels was greatly diminished. This could not fail to put a strain upon the heart.

Rupturing of alveolar septa diminishes the surface area available for oxygen-carbon dioxide exchange and so reduces pulmonary function. These pumonary changes, augmented by the effects of carbon monoxide contained in cigarette smoke, almost certainly account for the fact that shortness of breath has been found to be highly associated with cigarette smoking.[15]

These pulmonary changes observed in human beings appear to be parallel to the changes which Passey has reported finding in the lungs of animals experimentally exposed to cigarette smoke.[28]

Other Tissues

A century ago, Bouisson carried out a remarkable clinical study of 68 patients with cancer of the buccal cavity, of whom 45 had cancer of the lip, 11 cancer of the mouth, seven cancer of the tongue, and five cancer of the tonsil.[30] He found that all of these patients had a history of tobacco use. Those that developed lip cancer developed the disease at the point where they usually held a pipe or cigar between their lips. Since Bouisson's time, many investigators have reported a high association between tobacco use (smoking or chewing tobacco) and cancer of the buccal cavity; and an association has also been found between smoking and cancer of the larynx.[31-33]

The type of cancer commonly occurring in these tissues is epidermoid carcinoma; and epidermoid carcinoma has been produced experimentally by applying tobacco smoke concentrates to the skin of experimental animals.[34] Carcinogenic hydrocarbons in tobacco smoke fluoresce under ultra-violet light and it has been found that fluorescent material from tobacco smoke penetrates into cells of the buccal mucosa.[35] It should be noted that while the lungs are exposed to tobacco smoke only if it is inhaled, the lips, mouth, and tongue are exposed to the smoke even if it is not inhaled; and these tissues are also exposed to tars which collect at the end of a cigar or cigarette and drip from the stem of a pipe.

Due to nicotine, the inhalation of tobacco smoke has an effect upon the nervous system, and causes constriction of the peripheral arteries, as well as a temporary increase in heart rate and blood presgram and ballistocardiogram of some patients.[37] It also tends to inhibit secretion of antidiuretic hormone from the posterior lobe of the pituitary gland.[38]

It is uncertain whether the amount of carbon monoxide in cigarette smoke is sufficient to produce serious effects though it does result in the formation of several per cent of carboxylhemoglobin in the blood of the smoker.[39] If a cigarette smoker is also exposed to carbon monoxide in his occupation (e.g. a man driving a truck with a leak in the exhaust system), the combined exposure may be considerable. One of the reactions to the inhalation of carbon monoxide is a rise in red blood corpuscles. In experiments with human subjects, Eisen and Hammond found that cigarette smoking produces a rise in the number of red corpuscles in venous blood.[40]

In a well controlled clinical experiment, Doll, Jones, and Pygott found that cigarette smoking retards or prevents the healing of peptic ulcers in patients suffering from this disease.[41] Toon, Cross, and Wangensteen found that exposure to cigarette smoke increases the rate of occurrence of peptic ulcers in dogs treated with histamine.[42]

It is well known that Buerger's disease (a disease of peripheral arteries) is very highly associated with smoking.[43]

Evidence From Epidemiological Studies

Numerous clinical studies and so-called "retrospective" epidemiological studies have shown an association between cigarette smoking and various diseases including lung cancer, cancer of several other sites, coronary artery disease, peptic ulcers, and lung diseases other than lung cancer. The same ground has been covered in eight large prospective studies.[44-50] Since the results of all these studies have been essentially the same, I will, for the sake of brevity, just describe a few of the prospective studies.

Hammond and Horn[45] obtained information on the smoking habits of 187,783 white men between the ages of 50 and 69 who were then traced for a period of 44 months. The most important finding was that the death rate (from all causes combined) was higher among cigarette smokers than among non-smokers and increased greatly with amount of cigarette smoking. This is illustrated in Figure I in terms of mortality ratios (i.e. relative death rates), the age specific death rates of men who never smoked being used as a standard of comparison. The death rate of men who smoked less than half a pack of cigarettes a day was 34% higher than the death rate of men who never smoked. The death rate of men who smoked two or more packs of cigarettes a day was nearly two and a quarter times as high as the death rate of men who never smoked. Not shown in Figure I is the finding that the death rates of pipe and cigar smokers were somewhat higher than those of men who never smoked but not as high as those of even light cigarette smokers.

Essentially the same relationship between smoking habits and death rates was found in each of

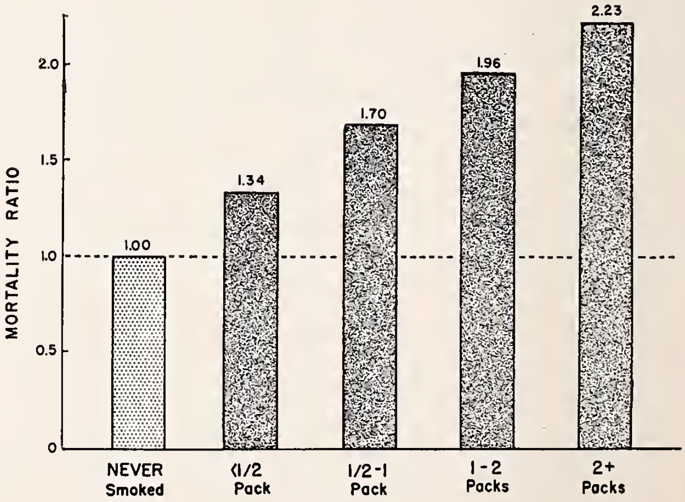

FIGURE I.

Mortality ratios (all causes of death combined) for men who never smoked and for cigarette smokers by number of packs of cigarettes smoked per day. Data from a study by Hammond and Horn.[45]

four groups when the subjects were divided by place of residence (rural; towns and suburbs; cities of 10,000 to 50,000 population and cities of over 50,000 population). Cigarette smoking is more common in cities than in rural areas. When standardized for smoking habits as well as age, the death rate was found to be 3.5 per cent higher in large cities than in rural areas.

At the time this study was made, I was a very heavy cigarette smoker myself. Therefore, I was most curious about the death rate of men who had given up the habit. Taking age and amount of cigarette smoking into consideration, we found that men who had given up the habit a year or more before being enrolled in the study had considerably lower death rates than men who continued to smoke cigarettes.

During the 44 months of the study, 1,644 deaths occured among men who had never smoked and 7,316 deaths occurred among men with a history of regular cigarette smoking. The first column of Table I (“observed deaths”) shows the 7,316 deaths of cigarette smokers classified by “principal” or “underlying” cause of death as reported on death certificates. The second column of Table I (“expected deaths”) shows the number of cigarette smokers who would have died during the 44 month period if their age specific death rates had been exactly the same as the age specific death rates of men who never smoked. The difference between the number of observed deaths and the number of expected deaths may be regarded as the number of “excess deaths” associated with cigarette smoking. (See the third column of Table I). The fourth column of the table shows the percentage distribution of excess deaths by cause of death; and the last column shows the ratio of observed to expected number of deaths.

TABLE I.
OBSERVED AND EXPECTED NUMBER OF DEATHS FROM VARIOUS CAUSES AMONG CIGARETTE SMOKERS. THE EXPECTED NUMBER OF DEATHS IS BASED UPON AGE-SPECIFIC DEATH RATES OF MEN WHO NEVER SMOKED. DATA FROM A STUDY BY HAMMOND AND HORN.[45]

CAUSE OF DEATH	OBSERVED DEATHS	EXPECTED DEATHS	EXCESS DEATHS	PERCENTAGE OF EXCESS	MORTALITY RATIO
Total deaths (all causes)	7,316	4,651	2,665	100.0	1.57
Coronary artery disease	3,361	1,973	1,388	52.1	1.70
Other heart diseases	503	425	78	2.9	1.18
Cerebral vascular lesions	556	428	128	4.8	1.30
Aneurysm and Buerger’s disease	86	29	57	2.1	2.97
Other circulatory diseases	87	68	19	0.7	1.28
Lung cancer	397	37	360	13.5	10.73
Cancer of the buccal cavity, larynx or esophagus	91	18	73	2.7	5.06
Cancer of the bladder	70	35	35	1.3	2.00
Other cancers	902	651	251	9.4	1.39
Gastric and duodenal ulcer	100	25	75	2.8	4.00
Cirrhosis of the liver	83	43	40	1.5	1.93
Pulmonary disease (except cancer)	231	81	150	5.6	2.85
All other diseases	486	453	33	1.2	1.07
Accident, violence, suicide	363	385	−22	−0.8	0.94

It is seen that for many different diseases (but not accidents, suicide and violence) the death rate of ′cigarette smokers was higher than that of non-smokers (i.e. the observed number of deaths exceeded the expected number of deaths). Over half of the excess deaths were attributed to coronary artery disease, 13.5 per cent were attributed to lung cancer, and 13.4 per cent were attributed to cancer of various other sites. Looked at another way, the death rate of cigarette smokers was higher than that of non-smokers by a ratio of 10.73 to 1 for lung cancer; 5.06 to 1 for cancer of the buccal cavity, larynx and esophagus; 4.00 to 1 for gastric and duodenal ulcers; 2.97 to 1 for a group of vascular diseases including aneurysms and Buerger’s disease; 2.85 to 1 for pulmonary diseases other than lung cancer; and 2.00 to 1 for cancer of the bladder.

Coronary artery disease is of particular importance since it is the leading cause of death among men in the United States. As shown in Figure II, the death rate from this disease increases with amount of cigarette smoking. Men who had

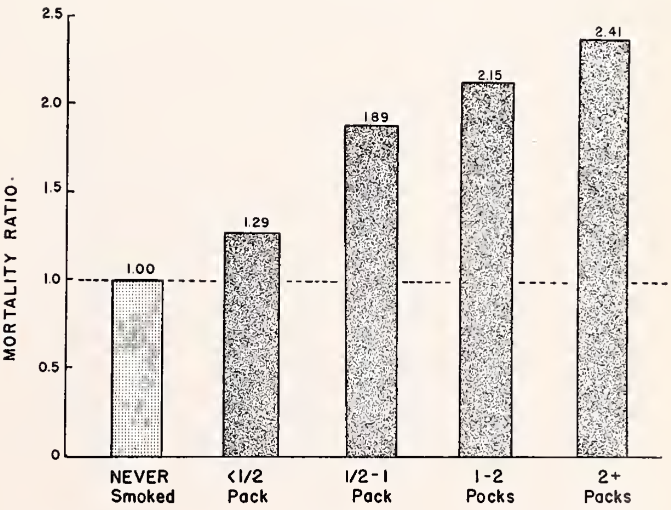

FIGURE II.
Mortality ratios due to coronary artery disease for men who never smoked and for cigarette smokers by number of packs of cigarettes smoked per day. Data from a study by Hammond and Horn.[45]

stopped smoking for a year or more before enrollment in the study had lower death rates from coronary artery disease than did men who continued to smoke cigarettes.

Information on cause of death as recorded on death certificates is not always accurate; and, in the case of cancer deaths, there may be uncertainty as to the primary site. Therefore, we sought additional information from the physician or from the hospital or a cancer registry on all deaths indicated on the death certificates as being due to cancer. It was found that on the basis of adequate diagnostic procedures (including microscopic evidence), 295 of the subjects were diagnosed as having died of bronchogenic carcinoma other than adenocarcinoma. (Most of these cases were diagnosed as epidermoid or undifferentiated carcinoma; but in some cases the histologic type was not specified, so a few may have died of adenocarcinoma). Of these 295 men, 4 had never smoked, 5 had been occasional smokers, 21 had smoked cigars or pipes but not cigarettes, and 165 had been regular cigarette smokers. Of the 165 cigarette smokers, 145 were smoking cigarettes at the time of enrollment and 20 were ex-cigarette smokers. The lung cancer death rate of the pipe and cigar smokers was far higher than that of nonsmokers but considerably lower than that of cigarette smokers. Taking age and amount of smoking into consideration, the lung cancer death rate of ex-cigarette smokers who had given up the habit for a year or more was lower than that of men who continued to smoke cigarettes. Figure III shows the age standardized lung cancer death rate (well established diagnosis other than adenocarcinoma) for cigarette smokers compared with that of men who never smoked. The rate was 3.4 per hundred thousand man-years for men who never smoked; 51.4 for men currently smoking less than half a pack of cigarettes a day; 59.3 for men smoking one-half to 1 pack of cigarettes a day; 143.9 for men smoking 1 to 2 packs of cigarettes a day; and 217.3 for men smoking two or more packs of cigarettes a day.

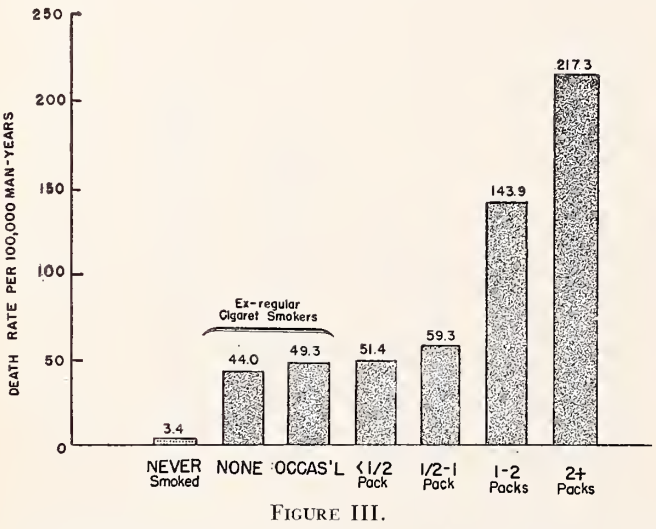

Figure III.

Age-standardized death rates due to well established cases of bronchogenic carcinoma (exclusive of adenocarcinoma) for men who never smoked and for cigarette smokers by number of packs of cigarettes smoked per day. Data from a study by Hammond and Horn.[45]

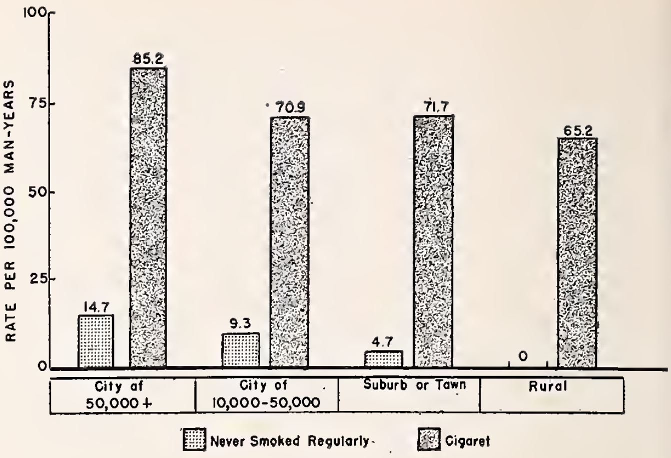

Figure IV.

Age-standardized death rates due to well established cases of bronchogenic carcinoma (exclusive of adenocarcinoma) by urban-rural classification. Rates for cigarette smokers are compared with those for men who never smoked regularly. Data from a study by Hammond and Horn.[45]

Figure IV shows the age standardized lung cancer death rates (well established diagnosis other than adenocarcinoma) for cigarette smokers and for men who never smoked regularly in relation to their place of residence. (The group labelled "never smoked regularly" includes occasional smokers as well as men who never smoked). Both for non-smokers and for cigarette smokers, the lung cancer death rate was higher in urban than in rural areas. However, in respect to lung cancer death rates, the difference between urban and rural residence was very small as compared with difference between cigarette smokers and non-smokers.

Large prospective studies by Doll and Hill[44] on British physicians, by Dorn[46] on American veterans, and by Best, Josie, and Walker[48] on Canadian veterans and pensioners all yielded essentially the same findings as have been described for the study by Hammond and Horn. A prospective study on lung cancer by Dunn, Linden, and Breslow[47] is noteworthy because it was carried out on men in occupations which were suspected as involving some hazard of lung cancer. Within various occupational groups, the same relationship was found between cigarette smoking and lung cancer as were found in the studies mentioned above.

A few preliminary results are now available from a prospective study being carried out on 1,069,000 men and women who were enrolled and are being traced by volunteer workers of the American Cancer Society.[50] These results indicate that, in relation to the total death rate, degree of inhalation of cigarette smoke may be as important, or perhaps more important, than the number of cigarettes consumed per day. Men in this study were asked whether they had ever been occupationally exposed to dust, fumes or vapors of any sort. The death rate from pulmonary diseases was approximately twice as high among those who answered "yes" to this question as among those who answered "no."[52]

The results of two prospective studies on smoking in relation to coronary artery disease, one in Albany, N. Y., and the other in Framingham, Mass., have been jointly reported by Doyle, Dawber, Kannel, Heslin, and Kahn.[49] On enrollment, every subject was given a medical examination. No symptoms of coronary artery disease were initially found in 4,120 men; and these men were re-examined from time to time for a number of years. Symptoms of coronary artery disease (as well as death from this disease) occurred far more frequently among those who smoked cigarettes regularly than among those who did not smoke. The total death rate was over twice as high among men who smoked more than 20 cigarettes a day as among men who never smoked.

Discussion

There is abundant evidence that contamination of the air we breathe can be injurious to health and result in a great increase in death rates from a multiplicity of different diseases. This can be said of air contamination from each of the three major sources: occupational exposures, general air pollution, and cigarette smoking. It is pointless to argue over which of these three types of exposure is the most important from the standpoint of health. All three are detrimental to health; and which of them does the most harm depends upon particular circumstances. Obviously, we should do all we can to reduce or eliminate the hazards.

Lacking preventative measures, certain occupational exposures to dusts, fumes, vapors, and gases can be extreme. Under such extreme conditions, occupational exposure can wreak greater havoc than either general air pollution or cigarette smoking. Fortunately, when recognized, this hazard can be eliminated by protecting workers from such exposure; and it can be reduced by having individual workers wear suitable masks. Thanks to the excellent work of industrial hygienists, the most serious occupational hazards have been brought under control in this country. It is uncertain how much of a problem still remains, particularly in relation to relatively light occupational exposures which do not produce obvious and dramatic effects upon the health of workers.

In a few instances, general air pollution has risen to such density as to result in a great increase in death rates from a multiplicity of different diseases. The most recent of these occurred in London shortly after I began to write this paper.[53] Fortunately, this latest episode was not so severe as the great London fog of ten years ago. However, it should serve as a warning to other industrial areas, particularly those so situated that air pollutants are not quickly dispelled by the wind. They would do well to take measures to prevent any further rise in the level of general air pollution. Control requires community action since it is impractical for individuals to wear masks except for short periods of time as was done by many people in London. The possible effects of a moderate degree of general air pollution is the subject of other papers in this journal.

Evidence from clinical, epidemiological, histological, and experimental studies indicates that inhalation of tobacco smoke, like heavy inhalation of many other air contaminants, is detrimental to health and results in an increase in death rates from a multiplicity of different diseases. The degree of the effects depends upon the degree of exposure: pipe and cigar smokers who typically do not inhale the smoke are affected to only a small degree; cigarette smokers who typically do inhale the smoke are affected to a far larger degree; and the degree of the effects increases with the number of cigarettes smoked per day, the number of years of cigarette smoking, and the extent to which cigarette smoke is inhaled.

Cigarette smoke and general air pollution in American cities are alike to the extent that they contain many of the same chemical compounds in the form of particles as well as an important gas (carbon monoxide). They differ in other respects. For example, general air pollutants are usually inhaled through the nose where a certain proportion of the particulate matter is removed while cigarette smoke is drawn through the mouth into the lungs. A high density of cigarette smoke is drawn into the lungs periodically during the day while a far lower density of pollutants in city air may be inhaled for relatively long periods of exposure on city streets and highways. Tobacco smoke alone contains nicotine.

From the standpoint of control, there is a most important difference between exposure to cigarette smoke and exposure to other air contaminants. Exposure to cigarette smoke is at the option of the individual. Thus control is up to the individual since he may avoid the hazard if he so desires. At the present time, community action is limited to public health education, particularly education aimed at young people who have not yet started to smoke. Whether any other sort of public action is either feasible or acceptable remains the subject of considerable discussion. However, the American Cancer Society does advocate that cigarette packages be labeled with the tar and nicotine content of the smoke.

The happiest solution would be the development of a relatively innocuous cigarette which is pleasurable to smoke. I am inclined to believe that this can be accomplished through a vigorous research program. At least, I think it likely that a cigarette can be developed which is considerably less harmful than present non-filter cigarettes. A first step, presumably in this direction, has been taken with the development of filter-tip cigarettes, the smoke from which contains only about half as much tar and nicotine as the smoke from ordinary non-filter cigarettes. As yet there is no proof that lowering tar and nicotine content of the smoke measurably reduces the harmful effects. However, there is reason to believe that this may be so since all available evidence indicates that the degree of harm from air contaminants is dependent upon the degree of exposure.

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Man Over Book—It is an intimidating thought that there is more information on organic chemical synthesis packed into the head of a spermatozoan than in all the 200 volumes of the *Journal of Biological Chemistry.*

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Air Pollution Effects On Vegetation

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The effects of air pollutants on vegetation have long been known. Although the unpleasant, disagreeable insult of air pollution on man's senses has been recognized as a nuisance, it has frequently been the failure of crops and the death of trees which finally precipitated action.

The history of effects of air pollution on vegetation may have started when men first began to roast the metal out of sulfide ores. In the first decades of this century, sulfur dioxide from smelters caused some of our most dramatic air pollution incidents—all involving forests and agriculture.[1] In time these problems were resolved. We are no longer making such dramatic kills of vegetation with sulfur dioxide from smelters. Now, rather than a few strong sources we have thousands of sources marking vegetation near practically all our industrial complexes. Sulfur dioxide is still a major air pollution problem.

In the early 1940's another industrial emission affecting agriculture developed. This involved fluorides. While the emissions were not as easily controlled as those of sulfur dioxide, the approach toward solution was similar to that developed in the smelter cases.

The problem of the major fluoride emitters has not been as well resolved as that of the major sulfur dioxide sources. Part of this can be attributed to the need to reduce fluoride emission to very low levels. Many plants that can tolerate extended exposure to SO_2 at levels of 0.2 ppm are marked by similar exposures to gaseous fluorides at concentrations a thousandfold less.[2] Because of the difficulties of control and the low levels that cause effects, there are several areas where fluoride injury is a serious problem. Slight to moderate markings are common around many industrial developments.

In the last few decades a serious insult to vegetation has developed in what we know as photochemical smog. This product of our modern urban life is known to cause agricultural losses of at least 10 million dollars annually in California alone.[3] While we associate smog with California, and Los Angeles in particular, this community no longer has, if it ever had, a monopoly on this phenomenon. The characteristic markings of smog have been found on vegetation near practically every metropolitan area in this country. The losses to agriculture in the belt from Washington, D. C., to Boston are estimated at some 18 million dollars a year.[3]

Our interest in symptoms of air pollution injury to vegetation is twofold. Certainly the effects on agriculture are of vital economic importance; secondly, the vegetation of an area provides an air quality sampling system. The markings on vegetation not only indicate the presence of certain pollutants, but frequently are a basis for estimating atmospheric levels. The symptoms of air pollution injury, however, while characteristic, are by no means specific. Insects, disease, nutrition, unfavorable climate, and poor care can all yield similar, if not identical, symptoms, as well as modify the air pollution pattern. Considerable care must be exercised in relating symptom to cause.

General Injury Symptoms

The injuries to vegetation that can be definitely attributed to air pollution involve characteristic patterns, of cellular collapse and necrosis of the leaf. While there are general growth effects, it is difficult, if not impossible, to identify the effect and relate it to an air pollutant by field observation alone.

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Sulfur dioxide is thought to enter the leaf through the stoma during normal gas exchange with the atmosphere. The stoma are specialized cells in the epidermis of the leaf capable of opening and closing entrances to the internal air spaces of the leaf. This process regulates the gas exchange or "breathing" between leaf and atmosphere. Exposures at night, under water stress, or at other times when the stoma are closed result in no injury.

Once inside the leaf the sulfur dioxide probably enters the cells as sulfite. The plant cells seem to be able to oxidize sulfite to sulfate at a definite rate. As long as this rate is not exceeded, there is no injury. When the sulfur dioxide concentration is such that this oxidation rate is exceeded, cellular relations are disrupted, resulting in cell collapse. The injured cells dry out and usually bleach to a light ivory or tan. The general pattern on a broad leaf plant is a blotchy pattern of light-colored, interveinal necrotic areas.

With grasses the blotchiness is modified by the parallel vein structure giving a streaked appearance. Frequently the tip is also affected. On conifers sulfur dioxide usually causes necrosis, progressing from the tip toward the base of the needle as the severity increases.

The threshold-type response of plants to SO_2 is helpful in assessing minimum levels of a fumigation. It also permits establishing air quality standards for various species of plants with a reasonably predicable degree of safety.[4]

Fluorides also cause a tissue collapse that is quite characteristic. We suspect that gaseous fluorides enter the leaf through the stoma over the entire leaf without producing injury. Once inside, the fluoride moves to the edges and tip of the leaf along with the normal flow of water. When the fluoride accumulates in the tissue beyond a certain level, the tissue along the margins and tip collapses, dries out, and usually develops a reddish-tan or deep-brown color. The necrosis progresses inward from the edge with time and continued exposure.

With grasses fluoride injury is always at the tip. It may extend down one edge more than another. With the conifers the needles die back from the tip, as from sulfur dioxide.

Since fluorides act as an accumulative poison, it is difficult to establish safe air levels. The extremely low levels in the atmosphere present many analytical problems. Periodic sampling of the vegetation of an area is frequently used to estimate exposure to fluorides.

The *photochemical smog complex* produces a variety of injury patterns. We know there are at least two phytotoxicants in this complex, ozone and peroxyacetyl nitrate (PAN). Some of the various symptoms can be related to the specific toxicants; other patterns can only be associated with "smog."[3]

The typical ozone pattern is an upper surface stippling with small, discrete, necrotic spots. These spots result from the death of small clusters of palisade cells. The palisade cells form a densely packed layer of cells on the upper surface of the leaf, just beneath the upper epidermis and are the site of most photosynthetic activity.

We are uncertain how ozone acts to kill these cells and not others. Apparently the ozone enters the leaf through the stoma, passes the nearby cells, and seeks out the palisade cells some distance away. In severe ozone injury the spongy parenchyma cells below the palisade are affected. Collapse in these cells seems to occur after the palisade cells have been affected.

The classic "smog" pattern of injury is an undersurface glazing or silvering. PAN produces this type of injury in controlled fumigation studies. In this type of pattern the spongy parenchyma cells are injured. Their collapse results in a slight separation of the epidermis, giving the glaze appearance. The color varies from silver to bronze, depending on pigment development. In more severe cases, and with time, the tissue dries leaving a blotchy, necrotic area on the undersurface. Frequently the necrosis extends through the thickness of the leaf.

Irradiated auto exhaust under controlled conditions has produced characteristic smog injury on plants.[5] Some of the injuries were characteristic of the patterns attributable to ozone; others were similar to the PAN type. Still other patterns have led these workers to suggest a spectrum of phytotoxicants.

Ethylene from manufactured gas was once a problem in greenhouses. With a better understanding of the hazard and a shift to natural gas and other fuels, the problems has almost disappeared.

Occasionally there are losses of ethylene from industrial sources sufficient to injure nearby field crops. Since ethylene is a product of many of our combustion processes, the levels in urban air are now frequently high enough to affect highly sensitive plants. The orchid bloom is highly sensitive, and the disease, "dry sepal," causes considerable loss in the orchid industry of Southern California.

Other air pollutants, such as chlorine, hydrogen sulfide, and nitrogen oxides, seldom occur in concentrations sufficient to injure vegetation, except as an accidental spill in industrial use. The weed killers used on roadsides and in agriculture have caused severe injury to surrounding vegetation. This is usually the result of accidental drift. Carelessness has also been involved.

Growth Effects

While growth effects are known and are associated with air pollution, identification and evaluation in the field are difficult. The plant is a product of its environment and air pollution is just one vector of this environment. Nutrition, water, light, temperature, plus all the factors we consider under "management" have their effect on the growth, development, yield, and survival of the plant.

In the Los Angeles area lettuce generally grows better in filtered air than in unfiltered air.[6,7] Yet we cannot say a specific crop has been reduced a definite percentage. We suspect there is a growth effect on perennials. We associate an early senescence of plants with smog. Without detailed symptoms and a better understanding of what air pollution does to the general physiology of the plant we cannot evaluate these growth effects.

Field Surveys

The characteristic symptoms of air pollution injury to plants can be a useful tool in field surveys. Because so many factors—insects, weather management, variety, etc.—affect the symptoms, their development, and their interpretation, great care must be exercised in using plants as indicators of air pollution.

A trained plant pathologist familiar with a given area would probably have little difficulty definitely identifying sulfur dioxide injury to a plant even though he had never seen the symptoms in the field. A pathologist completely familiar with sulfur dioxide patterns in the field would hesitate to make a definite diagnosis if in an unfamiliar area. While knowledge of the effects produced by air pollutants is important, it is equally important to know what else could be affecting the plant before attributing an effect to a specific air pollutant.

In any use of plants as a survey index of air pollution, a series of observations is required. This involves looking at more than one plant and more than one species; seeing air pollution injury and not seeing injury, since variability in sensitivity among varieties and species is an important key to any diagnosis; and comparing what the observer actually sees with what he expects to see based on his prior experience and knowledge.

We must always keep in mind that vegetation is a receptor of air pollution but with a variable response. The response varies with a host of prior conditions imposed on the plant. While the observation of air pollution injury confirms the previous existence of a significant air pollution level, failure to observe effects in no way denies the prior presence of a significant level of air pollution.

The references cited here have been selected as introductory to the field. They are not necssarily the first citation or the most significant but rather represent a good review or summary of a specific point.

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"Don't think: why not experiment?" was a sound injunction for its time. But if John Hunter were still alive he might sometimes now exclaim as usefully "Don't experiment: why not think?" for experiments seldom solve a problem unless they test some sensible hypothesis?"

Effect Of Air Pollutants On Wildlife

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THE subject is so vast that, for the space allotted, the discussion will be confined to general principles and broader aspects of the problem that have evolved as a result of recent laboratory research and field investigations on the biologic effects of air pollution on animal wildlife. Specific examples will be given only to illustrate these principles. The presentation represents a summary of present knowledge in this area as seen through the eyes of a toxicologist; it divides itself naturally into two phases: a brief review of the general state of knowledge presently available in the recent wildlife literature[1] as a result of field investigations, and a gathering together of those principles that come from recent laboratory research on air pollution. Although air pollution research is in its infancy, being scarcely more than a decade old, yet it is apparent that a number of important general principles are already emerging.

Definition Of Subject

I will use the term "wildlife" not in its usual context, but, rather, restricted to the various forms and species that are exposed naturally to air pollutants. These include mainly the nondomesticated birds and other vertebrate animals; also nonvertebrates, such as worms and insects. Fish are excluded and will be the subject of a separate discussion.

Field Investigations

A number of general conclusions can now be drawn from observations made to date in the field regarding air pollution effects on wildlife. Some of these conclusions, possibly obvious, must nevertheless be made to define the problem and provide an exact and clear frame of reference for subsequent, laboratory derived conclusions. Certainly a basic frame of reference is the establishment of the major air pollutants and their relative order of importance to wildlife.

Major Air Pollutants For Wildlife— Economic Poisons

Here a reorientation is needed in our views of what comprises the air pollutants of greatest health significance for wildlife as opposed to those for man. From field investigations the economic poisons appear to outweigh by far all other types of air pollutants as hazards to wildlife health. The insecticides, the chlorinated hydrocarbons and organic phosphates are shown heading the list of wildlife air pollutants, Fig. I. The reason for this is their broadcast distribution in agriculture and forestry by plane. Of the two, the chlorinated hydrocarbons probably present the greatest hazard; although they are less toxic generally than the organic phosphates, their tonnage use is greater and they are far more persistent, (more stable to weathering).

Pesticide use in particular imposes certain hazards for wildlife not shared by man. 1. Wildlife is not afforded a number of forms of protection and safeguards available to thinking man, through his knowledge of the hazards involved and the regulations for pesticide use. 2. Large area usage provides less escape opportunities for wildlife. 3. Pest-eradication measures, as the Fire-ant eradication program in the southeast, utilizing high dosage-treatment schedules inordinately enhance the toxic hazard to wildlife. 4. By their nature and their form of distribution, pesticides contaminate food sources of wildlife species. Birds are attracted to dying insects

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FIGURE I.

HEALTH EFFECTS OF MAJOR AIR POLLUTANTS AFFECTING WILDLIFE

AIR POLLUTANTS	ACTION
Economic poisons	
Chlorinated hydrocarbons	Nerve
Organic phosphates	Nerve-block cholinesterase action
Miscellaneous (herbicides, fungicides, nematocides, etc.)	
Metals, nonmetals and compounds	
Pb, As, Mo, Zn compounds	Blood, liver, kidney, nerve
F (Inorganic)	Bone
Radioactive particles	
I, Sr,	Transmission to man as food products.
Hydrocarbons	
Polycyclic hydrocarbons	Carcinogenicity
Petroleum distillates (olefins)	React with oxidants
Oil mists (insecticide vehicle)	"Lights up" respiratory infection Possible carcinogenicity
Reducing gases	
SO_2, SO_3	Respiratory tract irritant
H_2S, mercaptans, sulfides	Respiratory depressant
CO	Respiratory depressant
Unsaturated aldehydes	Respiratory tract irritant
Oxidizing gases	
O_3, NO_2, NO	Lung irritant, nerve (NO)
Organic peroxides	Radiomimetic properties
Free radicals	Carcinogenicity

poisoned by pesticides; the fall-out from heavy applications of DDT for control of the bark-beetle vector of Dutch elm disease may become concentrated in earth-worms producing a lethal effect on birds feeding on those worms. With the death of the bird the poison chain usually is broken by "dilution." The likelihood of a carion-eating species obtaining a sufficient number of poisoned birds is rather remote. Birds and small mammals have been poisoned by airplane sprays of aldrin, dieldrin, chlordane, heptachlor and toxaphene for the control of grasshoppers and crickets on range lands devoid of the concentration-reducing effect of high strata vegetation by sheltering.

It is clear from the above that the hazard to wildlife from economic poisons as air pollutants is chiefly from ingestion. Inhalation constitutes a far lesser exposure. In either case, air pollutant exposure to wildlife is considerably greater than for man under the same conditions. The higher metabolic rate of birds and small animals results in relatively greater food intake and higher respiration rate than man on a unit weight basis (mg pollutant/kg body weight). Foraging animals consume a large bulk of foliage on which the pollutant has accumulated.

It is the conclusion of a recent factual survey report of the National Research Council[1] that insecticides and rodenticides because of their purposeful development as toxicants for certain animal species, present greater hazards to wildlife than other classes of pesticides. In the normal course of use, however, insecticide hazard to wildlife is not the rule, rather it is in their overuse in eradication programs that significant hazards to wildlife occur. It is the final evaluation of the report (1962) that "the known impact of pesticide use on wildlife has been considerably less than that caused by other everyday activities of man."

Fluoride, Heavy Metals, Radioactivity

Oral intake certainly constitutes the main route of exposure of heavy metals, fluorides, and radioactive particles. In one of the few analytically documented reports of wildlife poisoning by air pollution, Prell[2] showed that airborne arsenic from a nearby smelter affected the red deer, foxes and horses in Saxony Forest. The deer were denuded of their hair, showed thickened skin, malformation of the horns, thickened joints, emaciation and other signs characteristic of arsenic poisoning. Arsenic concentrations of the stomach, intestinal contents, liver, kidney and hair of the different species varied from traces to 42 mg/ kg tissue. Clue to the discovery of arsenic as the etiologic agent was a peculiar mortality of bees some years preceding that was not traceable to infection but to smelter fumes. Analysis showed as much as 1 ug As/bee and 88 ug As/g pollen.

Airborne arsenic was similarly found to be the cause of widespread poisoning of sheep, cattle, and horses in Anaconda, Montana.[3] Deaths occurred in sheep feeding in a 15-mile area from the smelter; analysis of the grass and moss on which the sheep fed showed 52 and 405 ppm As respectively.

A few other examples will suffice to show that certain inorganic air pollutants can exert an effect on the health of animals foraging in the vicinity of factory fumes and dusts. Probably most common is fluoride fume, but lead and even molybdenum are similarly involved. Greenwood and his associates[4,5] have written extensively on the crippling effects of fluoride in turkeys and livestock from fumes of aluminum smelters using fluoride-containing ores. Hydrogen fluoride was believed to be the cause of injury to the respiratory and gastrointestinal tract of animals in the now-famous Meuse Valley air pollution incident. Numerous other reported and unreported injuries to animals exposed to fluoride containing atmosphere testify to the toxicologic potential of this atmospheric pollutant.

Poisoning of cattle and horses by air-borne lead and zinc has been reported[6] within a 5-mile radius of lead and zinc smelters. The affection was characterized by poor bodily condition, emaciation and pronounced swelling of the limb joints causing severe lameness necessitating slaughter. The condition was duplicated in animals fed samples of dust collected locally; the samples contained 45 per cent lead and 5 per cent zinc and only traces of arsenic and fluoride.

Molybdenum poisoning of cattle grazing in a pasture in the vicinity of a steel mill has been reported.[7] The smoke contained molybdenum, and the pasture vegetation contained upwards of 230 mg molybdenum per kilogram of dry matter.

A small number of recorded instances of poisonings among wildlife has been attributed to the remainder of the air pollutants included in Fig. I. Radioiodine from atomic fall-out has been found to increase at a rapid, but not injurious rate, in the thyroid of grazing animals. Radiostrontium has increased in milk, sulfides and mercaptans have been reported to have caused the death of several animal species in the Poza Rico air-pollution disaster in 1952, and the London "smoke" is said to have affected the health of birds, and ewes and hares fed vegetation damaged by smoke. Extensive laboratory investigations have been made, however, of the effects of the oxidizing gases, ozone and nitrogen dioxide, including organic peroxides on domesticated animals.

Species Susceptibility

It is apparent from the foregoing that little reported information exists on one important aspect of the problem, namely the relative susceptibility of wildlife species to air pollutants. The only guides that can reasonably be used at this time are the domesticated counterparts such as the chicken, turkey, and canary as representative of birds, and laboratory rodents, the dog and cattle, as representative of the vertebrate animals. Even here, information is limited to relatively few types of air pollutants. Fig. II provides a sort of guide to the relative susceptibility of a number of domestic animals to fluoride. As far as these dietary levels go, they indicate that fowl may be less susceptible to fluoride than cattle by a factor of 10 or so. Sheep and swine occupy an intermediary position of susceptibility. The Donora smog disaster,[8] which now in retrospect appears to have been caused by sulfur dioxide absorbed on particulate matter, was reported to have affected canaries as much if not more than fowl, the pigeon or the dog or cat (Fig. III). The dog was the next in order of susceptibility followed by fowl, cat and pigeon. The pigeon appeared not to be affected at all while the other species suffered injury and mortality. If these data showing the dog to be relatively susceptible to the Donora smog are reliable, it must mean that there is a wide range susceptibility within a given species to various smog components. The dog for example has been found generally to be highly resistant to the effects of the oxidant type smog of Los Angeles; we have had similar experience with the dog in regard to ozone and nitrogen dioxide. Again the canary, long considered to be the desirable indicator animal for man in detecting hazardous conditions in mines due to hydrogen sulfide, has been abandoned by the U. S. Bureau of Mines for this purpose because the canary proved to have no unusual susceptibility to this gas. On the other hand, it was the cattle that proved most susceptible to the effects of the 1952 London smog of which the chief component was sulfur dioxide; swine and sheep were unaffected. Thus, cattle are most susceptible to at least two types of air pollution, sulfur dioxide smog and fluoride.

FIGURE II.
SAFE LEVEL OF FLUORIDE IN LIVESTOCK RATIONS

SPECIES	SODIUM FLUORIDE OR OTHER SOLUBLE F (PPM)
Dairy cow	30-50
Beef cow	40-50
Sheep	70-100
Swine	70-100
Chicken	150-300
Turkey	300-400

Taken from Philips et al. Nat'l Res. Council Pub. No. 381 (1955).

FIGURE III.
ESTIMATED SMOG MORBIDITY AND MORTALITY RATES FOR DOMESTIC ANIMALS*

ANIMAL SPECIES	EST'D. NO. ANIMALS	ANIMALS AFFECTED PERCENT	ANIMAL DEATHS ATTRIBUTED TO SMOG PERCENT
Canary	20	20	10
Dog	245	15.5	4.1
Fowl	550	10.9	1.3
Cat	165	7.3	1.8
Pigeon	25	0	0

* Adapted from Donora Report.[8]

Thus the question of species susceptibility to air pollutants is highly complex and far too few specific details exist to permit any sound generalizations at the present time.

Laboratory Studies

We proceed now from the more directly established facts and principles from field investigations to some emerging concepts derived from laboratory research. We will present three such concepts: synergistic and antagonistic effects of air pollutants, tolerance and cross-tolerance to air pollutants, and the role of the immune response in air pollution effects. Unfortunately for wildlife interests, these concepts have by necessity been developed on domesticated animal species, i.e., the usual laboratory animals: mouse, rat, hamster, guinea pig, rabbit, dog, and chicken. By presenting concepts based on domestic animals we are implying that the reactions seen in laboratory animals have their counterparts in wild species, a not unreasonable implication.

Synergistic Effects Of Air Pollutants

One of the first questions that is frequently raised on the effect of air pollution on health is the possibility of some greatly enhanced or extraordinary effect from the interaction of a combination of two or more air pollutants on a host species. Such synergistic or potentiated effects have been demonstrated under laboratory conditions, for a number of insecticides. A mixture of two organic thiophosphates, malathion and EPN® have been shown to produce a far greater than additive effect when administered together in rats.[9] The synergized effect amounted to a tenfold increase over the expected toxicity. Other examples of synergism of organic phosphates have been found (Fig. IV).

Figure IV.
Potentiation of Acute Toxicity by Combinations of Organic Phosphates

ORGANIC PHOSPHATE	SECOND ORGANIC PHOSPHATE	MORTALITY* NO. DEAD/ NO. EXP'D.	PERCENT MORTALITY	EFFECT
Malathion	EPN	20/20	100	Potentiation
Malathion	Dipterex	20/20	100	Potentiation
Dipterex	Guthion	20/20	100	Potentiation

* One-half of the LD_{50} dose of each compound was given intraperitoneally to female rats.

From DuBois, AMA Arch. Ind. Health 18, 488, 1958.

It is seen that malathion also potentiates the effects of Dipterex,® a chlorophosphonate insecticide rather closely related chemically to malathion as is EPN.® Dipterex in turn potentiates the toxic effects of Guthion.®

Demonstration of synergistic effects is not confined to insecticides. The irritant effect of the gas sulfur dioxide has been shown to be synergized when inhaled in combination with salt crystals (by guinea pigs);[10] the response to the irritant gas formaldehyde is similar.[11] Hydrogen peroxide synergizes the effects of inhaled ozone gas;[12] and carbon monoxide has been shown to potentiate the toxic effects of a large number of gases when inhaled with it.

Antagonism

Just as a combination of certain insecticides may produce synergistic effects in animals, so does a combination of certain insecticides produce toxic effects less than expected. In this case such a combination is said to act antagonistically or demonstrate antagonism, one effect for the other. A number of such antagonisms are given in Fig. V. The instances given comprise a number of different combinations of organic phosphate insecticides.

Figure V.
Less than Additive Acute Toxicity by Combinations of Organic Phosphates

ORGANIC PHOSPHATE	SECOND ORGANIC PHOSPHATE	MORTALITY*	PERCENT MORTALITY	EFFECT
Parathion	Malathion	2/20	10	<Additive
Parathion	Guthion	2/20	10	<Additive
Dipterex	EPN	6/20	30	<Additive
Dipterex	Systox	2/20	10	<Additive
Malathion	Guthion	2/20	10	<Additive
Systox	Guthion	1/20	5	<Additive

* One-half of the LD_{50} dose of each compound was given intraperitoneally to female rats.

From DuBois, AMA Arch. Ind. Health 18, 488, 1958.

As with synergism, antagonism has been demonstrated in animals among gaseous air pollutants. Hydrogen sulfide has been shown to be a very effective antagonist to the air pollutants ozone and nitrogen dioxide.[13] Hydrogen sulfide was so potent an antagonist that one molecule was able to protect the host against 55 molecules of nitrogen dioxide or 15 molecules of ozone when inhaled with these gases at otherwise lethal concentrations. Other instances of antagonism among air pollutants could be cited.

It should be noted that the examples of synergism and antagonism are laboratory demonstrations made in animals at relatively high, acute, lethal concentrations of the pollutant. Further, relatively few air-pollutant combinations appear to show either type of effect. The question arises therefore as to the practical significance of these findings. Field conditions of exposure may not attain the high pollutant levels of the laboratory. Theoretic considerations indicate a progressively lessened toxic significance for the host at decreasing concentrations of the synergists and antagonists. A reasonable evaluation of the practical importance of these abnormal effects of certain air pollutants on the threat to the health of wildlife is that they represent an extra-hazardous potential, the degree of which is proportional to the toxicity of the pollutants and the intensity of the exposure. Under adverse conditions of exposure, synergistically acting pollutants could spell disaster for the exposed wildlife; or conversely, antagonistically acting pollutants could provide protection against disaster.

Adaptive Mechanisms

The above described phenomena deal with responses having their origin, at least, in the external environment of the host. The physiologic part the host plays in such instances is essentially passive. We will now discuss two phenomena in which the host tissues play an active part in attempting to counteract the injurious effects of air pollutants. These are (a) tolerance development and (b) the immunochemical response, both representing adaptive mechanisms of the host.

a. Tolerance And Cross-Tolerance

Important as the above observations are, a new development of laboratory research is probably of greater general significance—namely, the development of tolerance to air pollutants.[14] The tolerance we are discussing may be defined operationally as follows. When animals are exposed to certain air pollutants and subsequently challenged with lethal or multilethal doses of the pollutant, protection against the acute lethal effects is manifest; i.e., animals previously exposed to the pollutant survive, whereas animals not previously exposed, die. The type of pollutant to which tolerance is developed is any substance capable of producing pulmonary edema or pleural effusion. The tolerance is characterized by (a) rapidity of onset, (demonstrable directly following preliminary exposure), and (b) relative persistence, lasting from 1 to 14 weeks following a single exposure, depending on the pollutant and the intensity of the tolerance-producing exposure.

A further important characteristic of the tolerance is that it is not confined (only) to protection against pollutant which gave it rise, but affords cross-protection or tolerance against any other pulmonary edema-producing pollutant that has thus far been tried.[14] Figure VI shows a number of such examples. It is seen that a single exposure to ozone or ketene provides protection against the lethal effects of ozone. Partial protection is seen to be given by some pollutants, (certain peroxides). On the other hand, ozone provided complete protection for all mice exposed to a synergizing mixture of hydrogen peroxide and ozone. To illustrate the independence of the protective effect from structural similarity, the chemically unrelated germanium oxide and the sulfur-containing organic rodenticide ANTU (α naphthyl thiourea) has been included; no chemical relation exists between these compounds and ozone, yet cross-tolerance is observed.

The toxicologic significance of the acquisition of tolerance to certain types of air pollutants is that protection from otherwise fatal exposure is conferred on the animal that has had a prior low-grade exposure. The exposure may be single or repeated but should have been within the recent past.

b. Immunochemical Response

Another adaptive mechanism that has come to light recently as a result of laboratory investigations is the development of an immunochemical re-

FIGURE VI.
CROSS-TOLERANCES AMONG PULMONARY IRRITANTS AGAINST LETHAL EFFECTS IN MICE

PRE-EXPOSURE AIR POLLUTANT		CHALLENGING AIR POLLUTANT		24-HR. MORTALITY				
				PRETREATED		UNTREATED		PERCENT PROTECTION
AIR POLLUTANT	CONC'N PPM	AIR POLLUTANT	CONC'N PPM	NO. DEAD / NO. EXP'D	PER-CENT	NO. DEAD / NO. EXP'D	PER-CENT	ON BASIS OF CONTROL DEATHS
Ozone	1.1	Ketene	24	0/7	0	7/7	100	100
Ozone	1.0	NO_2	79	0/10	0	7/10	70	100
Ozone	1.4	H_2O_2	227	14/25	56	22/25	88	36
Ketene	7.8	Ozone	4.3	0/15	0	11/30	37	100
H_2O_2	46.2	Ozone	5.6	1/10	10	8/10	80	88
H_2O_2	37.0	NO_2	77	1/10	10	5/10	50	80
Cumene hydroperoxide	100	H_2O_2	226	1/10	10	5/10	50	80
Cumene hydroperoxide	100	NO_2	78	5/10	50	5/10	50	0
Cumene hydroperoxide	100	Ozone	5/6	6/10	60	6/10	60	0
Ozone	1.6	H_2O_2 Ozone	34.5 5.6	0/30	0	13/30	44	100
Germanium oxide	76 mg[a]	Ozone	10	1/6	17	7/11	64	74
ANTU	16 mg/kg[b]	Ozone	10	0/20	0	17/20	85	100

[a] Five daily injections totaling 76 mg.
[b] Intraperitoneal injection.

sponse of the host inhaling certain types of air pollutants. Although this response has been shown to occur with four substances, ozone, carbon disulfide, quartz and toluene diisocyanate,[14] there is reason to believe on theoretic grounds that the response is a fairly general one. Any inhaled substance that has the capacity to combine with tissue protein to a sufficient degree to alter the protein's chemical configuration so that it is no longer "recognized" by the body's enzymes as a normal protein will produce an immune response. In this particular adaptive mechanism however, the significance to the host lies not in the response itself, but in the subsequent manifestations it produces in the host. These manifestations may range through a whole spectrum of responses, accounting on the one hand, as with toluene diisocyanate, for almost the entire pathologic response of allergic sensitization of the respiratory tract, and on the other, to little demonstrable effect on the toxicologic response, as with ozone. The immune response to inhaled quartz particles is currently believed by some to be the major initiating event in the ultimate development of silicosis.

Thus, as far as has been learned, the adaptive response of the immune mechanisms appears to be generally disadvantageous to the host, in contrast to the immediate benefits to the host of the adaptive response of tolerance. There is some question however, whether there is a longterm advantge to the developed tolerance; circumstantial and unproved evidence indicates tolerance development may initiate fibrotic or emphysematous changes in the lung in some way, certainly conditions ultimately unfavorable to the host.

Summary And Conclusions

A review of information derived from both field and laboratory investigations of the effects of air pollutants on terrestrial animals indicates that (1) of all known air pollutants, economic poisons pose the greatest current threat to the health of wildlife. This threat becomes severe in pest-eradication programs where widespread use at high concentration prevails. (2) Inorganic substances, (certain heavy metals and fluorides), account for limited and local injury to wildlife based on known effects on domestic animals. Those air pollutants posing the greatest threat to the health of man have not been investigated sufficiently in wildlife to permit a decision in the matter. (3) The hazard to wildlife is chiefly from ingestion of the "fallout" of the air pollutant. (4) Relative species susceptibility to specific air pollutants is far from clear, but it would appear that the mammals are considerably more susceptible than birds. (5) Laboratory studies have revealed three rather general phenomena associated with exposure to air pollutants: a. Synergism, the exalted or potentiated toxic effect of combinations of certain air pollutants: its converse, antagonism, in which the summated toxicity is either far less than predicted or nonexistent. b. Tolerance and cross tolerance to pulmonary edema-producing agents. c. The immunochemical response. Both the latter are adaptive mechanisms of the host which, although superficially may appear beneficial, actually may represent a detrimental response.

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Clinical Medicine

Acclimatization To Heat

An Exercise In The Scientific Method

LOUIS H. NAHUM, M.D.
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The Observation

On the first day of exposure to heat a normal subject may collapse in attempting to complete a given work load and his body temperature will rise because he cannot lose his heat to the environment. This same individual having been exposed to heat for six to seven days with a lighter work load can perform the original task easily. He develops no cardiovascular difficulties, and his rectal temperature is much lower. We say he is acclimatized. What has happened to make him so different?

Formulation Of a Hypothesis

If the normal man collapses when forced to work in heat, he has obviously had a sudden burden placed upon his cardiovascular system. In an attempt to eliminate heat from his body there has occurred a large increase in minute volume of blood circulating through the skin. This acute diversion of blood to the periphery is responsible for a decline of venous return to the heart, a decreased stroke volume, severe postural hypotension, a rapid pulse. It resembles a shock-like state and we would expect compensatory mechanisms to divert blood from the kidneys and mesenteric system into the general circulation as happens in shock. On the other hand the man who is acclimatized maintains an increase in venous return and cardiac output in spite of large amounts of blood being shunted to the skin. Bazett *et al*[1-3] found that in the acclimatized man there is an increase in plasma and extracellular volume. Is acclimatization due to this expansion of plasma and extracellular volume and if so how does the body accomplish this life-saving adjustment?

Stages In Experimental Verification

Conn[4] observed that whether the hot atmosphere is dry or humid there must occur a loss of a large volume of sweat. His studies of subjects in a chamber at temperature 90° showed that they will lose five to seven liters of sweat per day. Normal sweat contains three grams of sodium chloride per liter so that the subjects will lose fifteen to twenty-one grams of salt in one day. Clearly such a large loss of sodium can lead to a sharp loss of weight as well as a sharp contraction of the plasma and extracellular fluid volume, enough to cause the hypotension and collapse of a subject working in a hot atmosphere. Unless the subject stopped sweating which is impossible in a hot atmosphere, he would have to stop sodium excretion in the sweat in order to survive acclimatization to heat. A simple measurement of the sweat of an acclimatized man showed that his sweat contained less than one grain of salt per liter, a saving of over ten to fourteen grams per day! The urine at the same time revealed almost a total disappearance of sodium. Thus the metabolism of early acclimatization to heat was characterized by intense salt saving activity of the sweat glands and the kidneys. Under conditions of large sweat volumes and variable salt intake the sweat glands remain extremely efficient in salt conservation, but the kidneys increase or decrease the excretion of sodium in order to maintain the proper state of positive sodium balance. It is clear that the major salt-saving function of the body is turned over to the sweat glands. This led Conn to formulate another hypothesis. The critical factor which determines successful adaptation to a hot climate is the speed with which and the degree to which the concentration of sodium in the sweat can be reduced.

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Experimental Verification Of Second Hypothesis

The phenomenon of salt sparing by the sweat glands that occurs during acclimatization to heat suggested that an increase in adrenal cortical function was involved in this process. If so, then one should be able to accomplish the same thing in the unacclimatized man, by administering a salt-saving steroid, originally desoxycorticosterone (DOCA) was used. Conn performed this experiment and found as predicted that DOCA caused a 50 per cent fall in concentration of sodium chloride and on cessation of the steroid, the values rose above the base line by 25 per cent before returning to normal. In other words sodium was retained in the body by the steroid and then given up again. We now know that the salt-saving steroid Conn used was really aldosterone and that sodium deprivation from whatever cause results in the increased elaboration of this steroid. If one considers that the aldosterone-sweat gland system can reduce losses of salt from the skin by as much as 95 per cent, it appears clear, that all forms of temperature regulation in hot climates would fail if it were not for the activity of this system in maintaining the volume of extracellular fluid.

If it is true that aldosterone is the agent by which expansion of plasma and extracellular fluid volume takes place during acclimatization to heat then one should be able to find increased amounts of this steroid in the urine of subjects during acclimatization. Conn measured aldosterone in the urine of men not working but exposed to humid heat and found a remarkable increase in the excretion of aldosterone.

If it is true that aldosterone is the agent causing expansion of plasma and extracellular fluid volume during acclimatization to heat then one should be able to abolish the acclimatized state by the use of spironolactone (aldactone) which antagonizes the action of aldosterone. Ladell[5] recently carried out just such an ingenious experiment. He gave aldactone to men acclimatizing to heat by ninety minutes daily heat exposures. The process of adaptation was disrupted upon oral administration of 300 mg spironolactone (aldactone). After the administration of the drug the urinary sodium chloride almost doubled during a twelve hour period. The sodium chloride concentration of sweat increased to levels that exceeded that observed on the very first day of heat exposure and the rectal temperatures increased above that observed on the first day of exposure to heat. Clearly antagonizing aldosterone destroys the adaptive bodily mechanisms involved in acclimatization to heat.

Explanation

It is thus possible to explain the results of acclimatization to heat almost wholly on the basis of increased production and activity of aldosterone But what brings the aldosterone mechanism into operation? It has already been mentioned above that two changes take place in the cardiovascular system upon initial exposure to heat with a moderate work load; a larger than normal proportion of the blood volume is diverted to the skin and the excessive sodium chloride loss in the sweat causes a contraction of the extracellular volume. A decreased cardiac output results and with it a decreased renal plasma flow. The juxta-glomerular cells are stimulated to secrete renin which in turn stimulates aldosterone secretion by the adrenal cortex. Increased aldosterone production causes urinary sodium to fall sharply and the reduction in the sodium chloride in sweat becomes evident within twenty-four hours.

The acclimatizing man can now with sodium retention gradually increase his extracellular fluid volume and plasma volume so that it is sufficient to supply the enlarged vascular capacity due to augmented skin blood flow, and also sufficient to maintain or even increase his venous return and cardiac output. One would suppose at first sight, that the increased load on the heart might in the long run adversely affect the myocardium of people who are living and working in hot climates. Here again, nature by one of its strokes of genius has seen to it that this does not happen, for aldosterone has been found also to be a powerful stimulant of myocardial contraction, more powerful even than digitalis.[6] By increasing myocardial efficiency and minimizing the prolonged effect of cardiac overload, aldosterone is doubly useful in heat acclimatized man.

Further Inferences

The reasoning which led to the elucidation of the mechanism by which acclimatization to heat takes place could hardly stop with the subject of acclimatization. The revelation that sodium chloride concentration in sweat and aldosterone production, go hand in hand should make it possible to test for aldosterone production by the sodium chloride concentration in sweat. In fact this has already been observed by Conn in the clinic. Addison's disease in which aldosterone is absent, shows high concentrations of sodium in sweat, while patients undergoing surgery revealed falling values of the sodium content of sweat for approximately eight days indicating increased aldosterone production.[1]

The mechanisms here elucidated, show the beauty of the scientific method and its success in arriving at explanations of fundamental phenomena in health and sickness.

L.H.N.

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CONSULTATIONS

When thou arte callde at anye time
A patient to see;
And doste perceave the cure too grate,
And Ponderous for thee:

See that thou laye disdeyne aside,
And pride of thyne owne skyll:
And thinke no shame counsell to take,
But rather wyth good will.

Gette one or two of experte men,
To help thee in that nede:
And make them partakers wyth thee,
In that worke to procede

. . . But one thing note, when two or moe
Together joyned be;
Abonte the paynfull patient,
See that ye doe agree

See that no discorde doe arise
Nor be at no debate;
For that shall discomforte hym,
That is in sycke estate

For noughte can more discomforte him,
That lies in griefe and peyne
Then heare that one of you dothe beare
To other such disdeine

Wherefore what so ye have to saye,
In things about your arte;
Let it be done among yourselves
In secrete and a parte.

With one consent uniformlye,
Comforte the ailing man;
But unto some good friend of hys
Express all that ye can . . .

—John Halle, M.D., *Goodlye Doctrine and Instruction,* 1529-1566.

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The Right And The Wrong Of Things

During the past several months, we have been looking in on a whole series of television interviews with leaders of some of the "sit-in" demonstrations which are being put on more or less nationwide. It has been our observation that many of those who are given an opportunity to talk into the microphone frequently refer to an important ruling of the U.S. Supreme Court as "the law of the land," and pretty regularly contend that such citizens as are not complying fully with that ruling are guilty of acting contrary to the Constitution.

It is more than a little noticeable, however, that when these spokesmen are asked what about the legality of certain aspects of the demonstrations, their composite answer seems to be that if they are violating any state or local ordinances in the course of their activities it is only because such ordinances are "bad" and that, in any event, the fathers of the American Revolution did no more or less in their day—they dared to break the law when the interests of "justice" needed to be served. And the remarks elicited from assorted bystanders suggest that for this particular point of view there is considerable public sympathy—if not downright endorsement.

We take no position here as to the issues which are presently being enjoined, nor do we question the sincerity of any person pleading a righteous cause. But we are prompted to hark back to the bitter attacks that were launched against Dr. J. Bruce Henriksen and his medical colleagues at the Point Pleasant (N.J.) Hospital some time ago, when they affixed their signatures to a resolution which stated (in effect) that if Congress should enact a King-Anderson type bill into law they did not intend to recognize the regulatory provisions of such a law in the care and treatment of their patients.

On that occasion, so great was the degree of public protest against Dr. Henriksen and his associates for presuming to "take the law into their own hands" that they were roundly criticized by most of the communications media, harshly condemned by officials in government and organized labor, and threatened with drastic punitive measures by the New Jersey legislature. No question was raised then about whether a King-Anderson statute would be "good" or "bad." It was enough that the physicians were considered to be challenging the authority of a law—even one which was not on the books.

We are sure that no right-thinking American will look with favor upon acts of civil disobedience by anyone or any group, but we find it a little hard to comprehend why one stand against injustice and oppression should merit any more or any less public praise than another.

W.R.R.

The Hand Is Quicker Than The Eye

Just recently we stopped into our favorite package store to pick up our modest weekly ration of protection against the cold, and were greeted by the proprietor with even greater cordiality than usual. "Hya, doc!" he began, coming forward to pump our arm, "Just the man I want to see! We need you to settle an argument."

"Okay" we agreed, after telling him to please stop calling us doc, "Who's doing the arguing and what's the question?"

"This guy Charlie here claims that a doctor can't charge anything extra if Blue Shield is paying for a patient's operation", he explained, "And I say he can. Now, which one of us is right?"

"Well, it all depends on what the family income is," we answered, sliding smoothly into our well-worn routine on the subject, "It would depend on whether the patient's entitled to service benefits or not."

"Never mind the double-talk, Mr. Professor!" he demanded, "Just give us the facts!"

"But those *are* the facts!" we came back, hurt that he should think we were stalling, "It *does* depend on the service benefits question."

"So what's the service thingamabob—the service benefits gimmick?" he inquired, impatiently, still not convinced of our sincerity, "Don't take so long to get to the point!"

"Well, look," we said, selecting a miniature bottle of exotic brew from the display shelf and holding

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– even when **OSTEOPOROSIS** is present

PABALATE-SF, which has been found "superior to aspirin in the treatment of chronic rheumatic disorders,"[1] possesses distinctive **Safety Factors** for elderly arthritics, even when osteoporosis is present: (1) its potassium salts cannot contribute to sodium retention; (2) its enteric coating assures gastric tolerance; and (3) it does not produce the serious reactions often noted during therapy with steroids or pyrazolone derivatives.

In each persian-rose enteric-coated tablet: potassium salicylate, 0.3 Gm.; potassium para-aminobenzoate, 0.3 Gm.; ascorbic acid, 50 mg.

1. Ford, R. A., and Blanchard, K. P.: J.-Lancet 78:185, 1958.

Precaution: Occasionally, mild salicylism may occur, but this responds readily to dosage adjustment. In the presence of severe renal impairment, care should be taken to avoid accumulation of salicylate and PABA. Supply: Bottles of 100 and 500 enteric-coated tablets.

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it up, "This little items is labelled $1.39, and that's your regular price—right?"

"Right!" he agreed, "But I don't see what that's got to do with ser. . . ."

"Now, if a customer comes in and tells you that his family income is less than so-and-so a year," we interrupted, "Will you let him have it for—say—seventy-five cents?"

"Are you out of your mind?" he groaned, visibly shaken at the mere thought of such a proposition, "$1.39 is a fair price, and I couldn't sell it to anyone for six-bits—not and stay in business. But for the last time, I ask—what's all this got to do with service benefits?"

"My good man, that *is* service benefits!" we concluded, cagily retreating toward the exit, "At least that's how participating Doctors make Blue Shield work. They just accept a lower-than-normal fee when the patient's income is not more than so much a year."

"You must be kidding, doc!" he called after us, his brow deeply furrowed in consternation. Say you were only kidding!"

We asked him again to please stop calling us doc, and then assured him we had not been pulling his leg. He was still shaking his head in disbelief as we turned the corner and moved out of sight.

In the car on the way home, we thought some more about how hard it is to really explain service benefits to people who aren't physicians—and *informed* physicians as well. Seems most folks think there's a limit to what can be done with mirrors, and just can't hardly believe that such magic will work successfully in business—or should even be tried, for that matter.

W.R.R.

COUNCIL MEETING
SUMMARY OF ACTIONS
June 27, 1963

I. ATTENDANCE

Present in addition to the Chairman, Dr. Martin, were: Drs. Pitock, Gilman, Cullen, Hess, Weise, Sr., Gardner, Scully, Wilson, O'Connor, Bradley, Grendon, Grant, Davis, Phillips, Hughes, Shepard, Weber, Jr., Ciccarelli, Gevalt, Egan, Abbot, Caplan. Also present were: Mrs. Lindquist, Dr. Richards. Absent were: Drs. Goldberg, Dean, Seigle, Spitz, Hastings, Medbury.

II. ROUTINE BUSINESS

Approval Of Minutes

It was VOTED to approve the minutes of the Meeting of May 29, 1963, as printed and distributed.

Life Membership

It was VOTED to approve applications for Life Membership for eligible Active Members as follows:

Carl E. Johnson, Hamden (NHCMA)
Hubbard Lynch, Fairfield (FCMA)
George H. O'Brasky, New Haven (NHCMA)

Reports Of Committees And Others

Advisory Committee To The Commissioners Of Welfare, Finance And Control

In an annual report of the Committee filed too late for presentation to the House of Delegates on April 30, 1963, several matters discussed by the Committee with the Commissioners were reviewed by the Council. Of the matters reported on, three were felt to be of considerable importance and it was VOTED to direct the Chairman and the General Manager to compose a letter to the Commissioners which would emphasize strong opinions of the Council as follows:

1. That at all times and in all situations possible, patients eligible to receive MAA (Kerr-Mills) assistance should be taken care of by private physicians and be classified as private patients. Any patient who is taken care of on "ward service" at a community hospital should be placed in this category only because of his own free choice.
2. That MAA payments for anesthesiology services by a physician should be made to the physician performing the service. It is recognized that the MAA payment schedule is based on 75% of the payment schedule of the CMS Preferred Contract, but it is the opinion of the Council that MAA need not be bound by CMS policy with respect to anaesthesia benefits.
3. That MAA payments for physicians' services of all kinds (including radiation therapy, radioactive isotopes, etc.) should be made to physicians' wherever performed, and that payments to hospitals for physicians' services should not be authorized under MAA policy. This opinion applies equally to all care rendered by private physicians in hospital emergency rooms.

Copies of the letter are to be sent to the chairman of the Advisory Committee to the Commissioners of Welfare, Finance and Control and the

Committee on Third Party Payments as information.

Delegates To The Connecticut State Dental Association

It was VOTED to accept the report of the Vice-President, James R. Cullen, on his attendance at the Annual Meeting of the CSDA in New London, May 22-23, 1963. Dr. Cullen had acted as the representative of the President, Morris P. Pitock, who could not attend the meeting. Dr. Cullen observed: "I know it is in the interest of both societies to maintain good rapport for mutual progress, especially now that the new medical-dental school is almost with us."

Delegates To The Medical Society Of New Jersey

It was VOTED to accept, with thanks, the report of a delegate, E. Tremain Bradley, on his attendance at the Annual Meeting of the MSNJ at Atlantic City, May 11-14, 1963. In his report Dr. Bradley stressed two matters which he felt to be of considerable importance:

1. He was greatly impressed with the efforts of the officers and staff of the New Jersey Society to make guests (such as delegates from other societies) feel welcome. Dr. Bradley is hopeful that suitable plans can be made to promote additional courtesies to delegates who attend meetings of the Connecticut State Medical Society in the future.
2. He presented a draft of a proposal presented to the New Jersey House of Delegates, titled: "Guides for Physician-Hospital Relationships in New Jersey." It was VOTED to reproduce this document (a part of Dr. Bradley's report) and to distribute copies thereof to all members of the Council and to members of Committees which may have an interest in the subject matter of the proposal.

Cancer Coordinating Committee

It was VOTED to accept the report of the Chairman of the CCC, William Mendelsohn, on the question of whether the Society should adopt an official position with respect to the alleged relationships between cigarette smoking and lung cancer, heart disease, etc. The gist of Dr. Mendelsohn' report was that: "It would be presumptuous for the Cancer Coordinating Committee to make a policy statement for our membership, each one of which is qualified to make up his own mind about the matter. If (it is felt) that the CSMS should make (such) a statement, then I feel every doctor should have an opportunity to express his opinion based on what he has read or any personal scientific investigation he may have conducted."

Committee On Preliminary Study Of Censorship Questions

The Chairman of the Committee, Michael R. Scully, reported that preliminary planning for review hearings has been completed (with legal assistance) and that the two cases assigned to the Committee are scheduled to be heard on July 1, 1963, at 160 St. Ronan Street, New Haven. In view of the fact that it is considered essential to have a quorum (five members) present to hear appeals, Dr. Scully recommended that alternate committee members be elected, on a county basis, so as to assure the necessary quorum being in attendance. It was VOTED to accept Dr. Scully's report, and it was further VOTED to elect alternate Committee members as follows:

FCMA—Ellwood C. Weise, Sr.
HCMA—James R. Cullen
LCMA—Frederick C. Gevalt
MCMA—John R. Egan
NHCMA—Jachin B. Davis
NLCMA—Clifford E. Wilson
TCMA—John F. Hughes
WCMA—Sawyer E. Medbury

Ad Hoc Committee on Corporate Practice Of Medicine

The Chairman, David A. Grendon, reported on a second meeting of the Committee held with representatives of the Connecticut Hospital Association. It appears that, as yet, these deliberations have not gotten beyond the "discussion" or "exploration" stage. Additional meetings are contemplated. It was VOTED to accept this progress report of the Committee. Observations by several members of the Council served to remind the Committee that it is expected to "prepare a possible course of action in this matter (corporate practice of medicine by hospitals; Blue Cross Out-patient Rider) for presentation to the Council."

Re AMA Committee on Osteopathy and Medicine

It was VOTED to accept, with thanks, the report submitted by Max Caplan, Alternate AMA Delegate, on his attendance at the meeting of this Committee of AMA, Atlantic City, June 19, 1963. Since the subject matter of Dr. Caplan's report is of interest to all members of the Society, it will be offered to Connecticut Medicine for publication, in part or in whole.

Date Of Next Meeting

The next meeting of the Council was scheduled for Thursday, July 24, 1963.

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Asher[1] has summarized the advantages of prolonged-action dosage forms: "First, they should be of great value in the suppression of night acid secretion in the ulcer patient. Also, in the ulcer patient, with high acid secretion during the day these drugs should be of help when used with regular doses of shorter-acting anticholinergic agents. A third application is in the chronic treatment of certain patients whose tendency to recurrent ulcer has been established."

Pro-Banthīne P.A. offers consistent, sustained anticholinergic effects for more consistent suppression of acid secretion and motility on simple twice or thrice daily dosage in most patients.

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Suggested Adult Dosage:
One tablet at bedtime and one in the morning, supplemented, if necessary, by additional tablets of Pro-Banthīne P.A. or standard Pro-Banthīne to meet individual requirements.

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Contraindications:
Glaucoma; severe cardiac disease.

Possible Side Actions:
Xerostomia, mydriasis and, occasionally, hesitancy in urination. Theoretically, a curare-like action may occur.

---

[1] Asher, L. M.: The Choice of Anticholinergic Drugs in the Treatment of Functional Digestive Diseases, Amer. J. Dig. Dis. 4:260-275 (April) 1959.

III. OLD, NEW AND SPECIAL BUSINESS

Proposal Of Division On Public Relations

It was VOTED to receive a proposal of the Division on Public Relations concerning a series of newspaper medical interviews, and to refer the proposal to the Special Committee to Study Committee and Staff Structure of the Society for evaluation and report.

Connecticut Medical Service, Inc.

A substantial portion of the Council's time at this meeting was devoted to a discussion of the legal action instituted by the Society on June 13, 1963, (concerning the Council's right to name the physician directors of CMS and a June 6th amendment to the CMS Bylaws), the formal relationship of the Society with CMS which does and should exist until the legal controversy has been resolved, and questions relevant to certain CMS contract proposals.

Significant actions were taken as follows:

a. Having received and reviewed copies of CMS proposals on a "Special 500 Contract" and an "Endorsement" to cover anesthesiology services, and having considered an invitation from CMS to hold a liaison meeting for the purpose of jointly discussing these proposals, it was VOTED to direct the Chairman to write a letter (subject to legal counsel's approval of its form) to the Executive Director of CMS, Inc., asking him to inform the Board of Directors that the Council does not wish to take part in such a liaison meeting at this time for the following reason:

   The legal position of the Society is that the present Corporators and/or Board of Directors of CMS, Inc. cannot be recognized by the Society as having been legally elected, and that, therefore, to have dealings with same might be construed as recognition by the Council of the legality of their offices. It would be entirely unmeaningful for the Council or CMS, Inc. to maintain a facade of "doing business as usual" with each other, while this serious and basic question remains unresolved by the Superior Court of New Haven County. It is understood that the Superior Court is not likely to conduct a formal hearing on the question before September of this year.

b. It was VOTED that the Council direct its endeavors toward keeping all members of the Society informed as to the nature of the legal action being taken against CMS, Inc. and of the developments in this matter as they occur. It was generally understood that such "endeavors" would consist of explanation of the Society's position to groups of physicians at the "grass roots" level by members of the Council; discussions of the Society's position with the governing bodies of the county medical associations by the county councilors; and general mailings to the membership of pertinent materials which will create a fuller understanding of the questions at issue among the physicians of the state. In a specific action, it was VOTED to direct the General Manager to mail each member of the Society a copy of the "Statement of the Council, Connecticut State Medical Society, April 17, 1963."

Request Of CSMS Section On EENT

It was VOTED to approve a proposal received from the Section on EENT that the Section, by vote of the members in accordance with the bylaws, be dissolved at an annual meeting (probably 1964) and two sections be formed subsequent to this action. The new sections would be called, respectively, the Section on Ophthalmology and the Section on Otorhinolaryngology of the Connecticut State Medical Society. By so voting, the Council will recommend to the House of Delegates at the semiannual meeting in December that the present Section on EENT be authorized to take these actions, if so voted by the section's membership.

Commendation Re Health Careers Booklet

It was VOTED to commend the work of the Committee on Health Careers, its Chairman, Bernard F. Mann of New Haven, members of the Woman's Auxiliary, Mrs. Josephine P. Lindquist of the office staff, and all others who participated in the plan ning, printing and distribution of the booklet titled: "Connecticut Health Career."

I.V. Technician Training Program

The Council reviewed copies of correspondence between Dr. Martin and Dr. Maxwell O. Phelps, President of the Hartford Hospital Medical Staff, and between Dr. Franklin M. Foote, Commissioner of Health, and Mr. P. Whitney Spaulding, Assistant Director of Hartford Hospital, all of which related to the Hartford Hospital's proposal to train high school graduates to be Intravenous Technicians and to administer intravenous therapy to patients under the supervision of a qualified registered nurse.

After considerable discussion, it was VOTED that the Council of the Connecticut State Medical Society go on record as disapproving the proposed I.V. Technician training program at the Hartford Hospital and to inform the Commissioner of Health of this action. The bases for the disapproval of the program by the Council are as follows:

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Practically standard treatment, now, for perforated ulcer. Why is Maalox included? Antacid therapy *must* continue long after the wound has healed, and patients started on Maalox tend to stay on Maalox. It tastes good; it's effective and will not cause constipation—three important reasons for Maalox over the long haul. Some physicians, we are told, order Maalox routinely for hospital patients on drugs which could irritate. They feel it reduces the likelihood of gastric discomfort. Supplied: Suspension; Tablets No. 1; Tablets No. 2. (Each Maalox No. 1 Tablet is equivalent to 1 teaspoonful and each Maalox No. 2 Tablet is equivalent to 2 teaspoonfuls of Suspension.)

RORER

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a. Two written opinions of the Attorney General of the State of Connecticut have ruled that the insertion of a needle into the vein (of a living person) is a surgical procedure and, therefore, can be done only by a person licensed to practice medicine and surgery.

b. Recognizing the practicability and medical soundness of utilizing specially trained, licensed R.N.'s to administer intravenous therapy under the full supervisional responsibility of a licensed M.D. in such facilities as a hospital's recovery room, it is felt that it would be most hazardous to delegate the doctor of medicine's responsibility further, through a nurse in charge, to a high school graduate. The latter's performance, however technically correct, would constitute an ever-present threat to the standards of good patient care because professional judgment and awareness and prompt recognition of adverse reactions to intravenous therapy would be lacking in persons having such a minimal educational background in medicine.

Election Of Student Member

It was VOTED to elect to Student Membership Eligio A. Petrelli of New Haven. Son of Joseph V. Petrelli, M.D., this student is presently attending the Georgetown Medical School, Class of 1966.

N.B.: The foregoing is a summary of the proceedings and actions of the Council on June 27, 1963. Detailed minutes of the meeting are on file at 160 St. Ronan Street, New Haven, for perusal by any interested member of the Society.

PLACEMENT WANTED

The Society's Placement Service is in receipt of the following:

Stuart Rubenstein, M.D., Age 30, State University of New York College of Medicine, 1957. Specialty—Internal Medicine.

Obstetrician-Gynecologist, age 37, University trained, board eligible, 3 years solo practice. Seeks relocation in association, partnership or group.

PLACEMENT OPPORTUNITIES

Excellent opportunity available to a general practitioner to affiliate as an Associate with an established physician.

General Practice including Obstetrics. Vacancy left by busy practitioner, growing community with modern hospital being enlarged to eighty beds.

ANYONE INTERESTED IS ASKED TO COMMUNICATE WITH THE GENERAL MANAGER'S OFFICE, 160 ST. RONAN STREET, NEW HAVEN.

1963 MEETINGS

September 27—38th Connecticut Clinical Congress to be held at the Yale-New Haven Medical Center.

October 13-16—Nurses Conference, sponsored by District I, of the American College of Obstetricians and Gynecologists will be held at the Hotels Statler and Bond, Hartford, Connecticut, from Sunday, October 13th through Wednesday noon, October 16th.

October 16-19—Annual Meeting of District I, of the American College of Obstetricians and Gynecologists will be held at the Hotels Statler and Bond, Hartford, Connecticut, from Wednesday, October 16th through noon on Saturday, October 19th.

October 24—180th Semi-Annual Meeting of the New Haven County Medical Association will be held on Thursday, October 24, 1963 at the Waverly Inn, Cheshire, Connecticut. The Business Meeting is tentatively scheduled for 2:30 P.M.

October 25-26—Regional Meeting of the American College of Physicians, New England States, Quebec and Maritime Provinces, Hotel Statler, Hartford, Connecticut.

November 13-14-15—New England Postgraduate Assembly to be held at Statler Hotel, Boston.

December 4—Annual Meeting of the Connecticut Society of American Board Surgeons, Inc.

1964 MEETINGS

May 25-27—Annual Meeting American Thoracic Society Medical Section of the National Tuberculosis Association to be held in New York City.

June 14-19—The VII Interamerican Congress of Cardiology will be held in Montreal, Canada.

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positive protein metabolism;
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Side Effects and Precautions: Prolonged administration can produce mild hirsutism, acne or voice change. In an occasional patient, edema has been observed and in young women the menstrual periods have been milder and shorter. These side effects are reversible, and patients receiving prolonged treatment should be examined and questioned periodically so that, should side effects appear, the dosage may be reduced or administration of the drug discontinued for a time.

In patients with impaired cardiac and renal function, there is the possibility of sodium and water retention. Liver function tests may reveal an increase in bromsulphalein retention, particularly in elderly patients. In such cases, therapy should be discontinued. Although it has been used in patients with cancer of the prostate, its mild androgenic activity is considered by some investigators to be a contraindication.

Dosage: Usual adult dose, 1 tablet t.i.d. before or with meals; young women, 1 tablet b.i.d.; children (school age): up to 1 tablet t.i.d.; children (preschool age): ½ tablet b.i.d. Available as scored tablets of 2 mg. in bottles of 100. For best results, administer with a high protein diet.

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ACCIDENT AND HEALTH PLAN

In addition to the above, members up to age 40 may now purchase their Accident and Health protection at a 25% reduction in cost.

Through its continued official sponsorship of our Group Plans, The Connecticut State Medical Society has once again made it possible to offer broadened coverage under these two time-tested policies to members of the Society. If you are not now enrolled, do not turn your back on old friends who have served Connecticut physicians for over a quarter of a century. If a sufficient number of new applications are submitted for the Major Medical Expense Plan, all policies will be issued regardless of past medical history. For full information write or phone.

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REPORT OF THE
COMMITTEE ON OSTEOPATHY AND MEDICINE
AMERICAN MEDICAL ASSOCIATION

(At the request of the Council, Max Caplan, Alternate Delegate to AMA, herewith reports on his attendance at the meeting of the Committee on Osteopathy and Medicine).

This is a report of a breakfast meeting with the Committee on Osteopathy and Medicine which was held at the Traymore Hotel on June 19, 1963 from 7:30-9:00 A.M. I should like to state that I appreciate the Council's directive that I attend this meeting. I welcome the opportunity to serve the Council and State Society in any way I can.

The purpose of the meeting was to attempt to assay the present status of osteopaths in various communities of the United States. While there does not seem to be any immediate problem in our State, one of our New England States, the State of Maine, is beset by numerous difficulties. There are more than 350 osteopaths there who operate in five osteopathic hospitals. They have all privileges in these hospitals, even open chest surgery. In spite of possessing these privileges they allegedly are not well trained and many of their operations could not pass rigid tissue committee analysis according to these committee reports. There is some talk at the present time of their building an osteopathic medical school and the $30,000,000 which this will cost is being partially subsidized by the Federal Government. Many of these osteopathic physicians have come to Maine because they have been unable to pass the rigid examining boards of Connecticut and Massachusetts. A further problem is that certain of them who have been osteopathic physicians in California and have been granted MD degrees retroactively consider themselves as true MD's. They are accepted in most of the post-graduate courses, on some hospital staffs, and in some local medical societies.

The situation in Washington was outlined by Dr. Crystal. A group of osteopathic physicians met with Washington physicians. The Washington State Medical Society has been trying to award them MD degrees retroactively but has found out that at present this is illegal. The State of Washington is planning to create a degree award committee. This sets up a peculiar situation in which degrees are awarded not by medical schools but by a special committee.

Pennsylvania is having its problems in that the osteopaths do not seem to wish to become MD's. They are enjoying many advantages in their practice with very little obligation and hence they do not wish to lose their special privileges.

Colorado has osteopathic physicians on its medical examining board. Both groups take the same exam. There is no talk of any merger, rather of co-operation. In this state there are 2400 MD's and 220 DO's. There are also nine MD's who are converted into same from California. Two have been accepted into medical societies. However, at present the degree (converted MD) is considered illegal in Colorado.

Michigan has the greatest number of osteopathic physicians. More than 500 have come into the State in the past two years. There are two licensing boards in Michigan, one for MD's and one for DO's. They are now trying to form an osteopathic school in Flint, Michigan. In this State it is up to the local medical societies to decide whether osteopaths are admitted to hospitals. However, the licensing board in Michigan does not recognize converted MD's.

Iowa has a composite board bill. There are 450 osteopaths and 2800 medical doctors. About 150 osteopathic doctors have taken an extra year of training. After July 1st they will take the same exam as MD's but on passing will get osteopathic degrees. They are now planning to build a larger school. Only two members of the graduating class come from the State of Iowa.

In the State of California the osteopathic school in Los Angeles was accredited as an approved medical school and had its first graduating class in 1962. These graduates are considered equal to medical graduates. Graduates of osteopathic schools who have licenses in California were given MD degrees which are recognized in California. The Council has not recognized these converted MD's. The California Osteopathic Society is now (1962) the 41st medical society in California. Before this there were 40 California County Medical Societies. This 41st society is a haven for osteopathic physicians in California which is without geographical boundaries and has representation in all the counties. This 41st medical society will continue to exist until all of their osteopathic members (2000) are taken into the County Medical Societies. Some of these osteopathic physicians have taken up residency training programs not because they will be certified but because they recognize the need for training. Many of them have been accepted in the California Academy of General Practice. The California Hospital Association has issued an edict to all member hospitals to open their staffs and to admit these converted MD's as other MD's. If they ask for privileges in certain specialties they are interviewed and, if qualified, are given these privileges. However, there is no specialty certification as yet. Most of the former osteopathic hospitals in California now belong to the California Hospital Association. About six of them are now accredited. Most societies have established liaison with the 41st medical society. These meet with each other and these converted MD's are considered as equal members of the society in their programs but without voting privileges. The societies have requested that these converted MD's file a request of intent to join the local society when they are released from the 41st medical society.

I have tried to report factually what took place at this meeting. I have literature which was handed out concerning some of the areas of which I spoke, and if the Council or the State Society so requests I will be glad to submit this.

I wish to thank the Council again for the privilege of attending this meeting.

Respectfully submitted,
Max Caplan, M.D.
Alternate Delegate to AMA

Cooperative Approach To Pollution Advocated

The most effective way to minimize the air pollution problem is through cooperative efforts of government, industry, and the public, a report adopted by the AMA House of Delegates said.

The report noted that the federal government should play a significant role in combating air pollution, but that "there appears to be no need now . . . to empower a federal agency to seek from the court a remedy already available . . ."

It pointed out "the existing right of individual citizens and local or state jurisdictions to seek redress or petition a court to abate a nuisance."

The report suggested that the role of the federal government should include grants for research activity and the encouragement of local programs for pollution control.

Letter To The Editor

June 13, 1963
Hartford, Connecticut

To The Editor:

I wish to congratulate you on printing one of the best editorials I have ever read in many a year concerning aging. It is in the April, 1963 issue of Connecticut Medicine and is entitled, "Old Age or Sickness." I hope it will be read by and given careful thought and every consideration by all the physicians here in Connecticut.

I have been interested in the field of aging for years and after reading your editorial I reviewed some of the material in my files and was pleased to note a similarity in some of our remarks on this subject. I believe that successful aging is an individual problem and that there is a definite need of an awakening, both by the older person and the physicians, to a more complete understanding of both the physiological and psychological problems associated with aging.

I am enclosing some material published by this department on the problems of aging and maintaining physical fitness which I would like to have your comments on when you get a chance to look them over and evaluate in your spare time.

Sincerely yours,
Alexander J. Tutles, M.D., Director,
Medical Services Division, State Department of Health, State of Connecticut

BOOKS RECEIVED

Books received for review are acknowledged in this department and such acknowledgement must be regarded as a sufficient return for the courtesy of the sender. Selection will be made for review in the interests of our readers and as space permits.

Handbook of Pediatric Medical Emergencies Third Edition by Adolph G. DeSanctis, M.D., and Charles Varga, M.D., The C. V. Mosby Co., St. Louis, Mo., 1963 457 pp. $12.75.

Clinical Anatomy by Otto C. Brantigan, M.D., F.A.C.S., McGaw-Hill Publishers, New York, 1963 421 pp. $15.00.

Protein Metabolism. An International Symposium, Springer Verlag, Berlin. Gottingen. Heidelberg, 1962 521 pp.

Hypertension-Vasoactive Mechanisms, Volume XI. Edited by Simon Rodbard, M.D., The American Heart Association, New York, 1963 71 pp. $2.50.

Cardiovascular Abstracts 111 1962 Selected from World Literature American Heart Association, New York, 193 pp. $3.00.

Results of Surgery for Peptic Ulcer Edited by R. W. Postlethwait, M.D., James C. Thoroughman, M.D., Associate Editor, W. B. Saunders Co. Phila., Pa., 1963 308 pp. $8.00.

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light drowsiness may occur with meproba-nate and, rarely, allergic reactions. Mepro-amate may increase effects of excessive lcohol. Use with care in patients with suicidal endencies. Massive overdosage may produce oma, shock, vasomotor and respiratory col-apse. Consider possibility of dependence, par-icularly in patients with history of drug or alcohol addiction. Withdraw gradually after prolonged use at high dosage.

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Doctor's Office

Gerald I. Blank, M.D., announces the opening of an office for the practice of internal medicine at 601 Farmington Avenue, New Britain.

Joseph Forbes Connelly, M.D., announces the opening of an office for the practice of internal medicine at 1785 Boston Avenue, Bridgeport.

Jerry Crawford, M.D., announces the opening of an office for the practice of internal medicine at 295 Farmington Avenue, Hartford.

William M. Donnelly, Jr., M.D., announces the opening of an office in association with Herbert M. Magram, M.D., for the practice of obstetrics and gynecology at 100 Broad Street, Middletown.

James R. Dorr, M.D., announces the opening of an office in association with John J. McGarry, M.D., for the practice of internal medicine at 381 Post Road, Darien.

Gregory K. Dwyer, M.D., announces the removal of his office from 85 East Avenue to 5 Elmcrest Terrace, Norwalk.

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In Memoriam

Ellison, Frederick S.—Hartford; Yale Medical School, 1934. Dr. Ellison was a member of the Hartford County Medical Association, the Connecticut State Medical Society, and the American Medical Association. He was past president of the New England Proctological Society and an honorary member of the Piedmont Proctological Society of Piedmont, North Carolina. Dr. Ellison was a fellow of the American Proctological Association. A consultant with Manchester Memorial Hospital and Backus Hospital in Norwich. Dr. Ellison died June 30, at the age of 55.

Schmidt, Henry G.—Bridgeport; Cornell University Medical School, 1953. Dr. Schmidt was a veteran of the United States Army. He was chief pathologist and director of laboratories at St. Vincent's Hospital. Dr. Schmidt was a member of the Fairfield County Medical Association, the Connecticut State Medical Society, the American Medical Association, the New York State and county medical societies, and the New York State Pathological Society. Dr. Schmidt died June 16, at the age of 35.

Zariphes, Constantine, A. P.—Hartford; Boston University, 1924. Dr. Zariphes was a practicing physician in the Hartford area for 25 years. He was on the courtesy staff at Hartford, McCook, St. Francis, and East Hartford hospitals. Dr. Zariphes was a veteran of World War II and served as a major in the Medical Corps in the European Theater in the field hospital in England, France, Belgium, Luxemburg, and Germany where he received two citations. He was a member of the Hartford County Medical Association, the Connecticut State Medical Society, the American Medical Association, the American Hellenic Educational Progressive Association and a trustee of the Open Hearth. Dr. Zariphes died July 2, at the age of 65.

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NEW BOOKS IN REVIEW

BILBARZIASIS; A Ciba Foundation Symposium. Edited by G. E. W. Wolstenholme and Maeve O'Connor. Little Brown and Co., Boston 6, Mass. 46 illustrations, 433 pp.. $11.50.

Reviewed by: ROY N. BARNETT

This is an interesting discussion of a very specialized subject, at least by Connecticut standards. It represents contributions and discussion by 26 authorities at a meeting held jointly with the Egyptian Medical Association in 1962.

Schistosomes are important agents of disease in many parts of the world. Their importance increases as populations grow and more persons are brought into villages in closer contact with cultivated land and with water channels. In Egypt the incidence is 50-60% in rural areas irrigated perenially. Animal reservoirs do exist, and in some instances, for example rats in the Philippines, are important in maintenance of the disease.

The organisms cause a variety of clinical diseases. In S. haemotolium infection bladder neck obstruction is common, and 6.5% of infected bladders develop carcinoma. In Egypt 70% of cirrhosis is of bilbarzial origin; although the pathology differs from that of other forms of cirrhosis the clinical features do not. 4% of cardiac disease in Egypt is due to bilbarzial cor pulmonale.

There are reported extensive studies on control measures. One involves treatment of infected persons, many of whom are asymptomatic, with antimony compounds; no other drugs are presently considered valuable. An enriched diet may enhance the effect of the antimonials. Another is education of humans to avoid excretion into streams and to avoid exposure to contaminated water. Snail control both by altering the environment and by molluscicides is desirable but difficult, partly because the natural conditions vary so widely that measures which are very useful in some areas are futile elsewhere.

There is also considerable more basic material on host resistance and immunity, relation of the schistosomes to both mammalian and mollusc hosts, and mechanisms of drug action.

A chapter entitled "Important Achievements In the Control Of Bilbarziasis In New China" by Mao Shou-Pai is so revealing to the Western reader that the summary is quoted in full as follows. "The chief characteristics of research on the prevention and treatment of bilbarziasis in New China are that work is carried out under the direction of the Chinese Communist Party and People's Government, under a carefully planned program and with a sound system. These three factors are coordinated and they supplement each other. Tremendous successes have therefore been achieved in the last 12 years. With firm belief, workers in our country are striving for the control and eradication of this great scourge-bilbarziasis." It is a great comfort to know that the Chinese Communists are opposed to bilbarziasis! The rest of the chapter discusses a few clinical facts familiar to medical students and provides no data to support the sweeping claims of progress in the summary quoted. An entrancing search in New China is that for chemical compounds having a quick ovicidal effect on night-soil, which "might be required for immediate use"

For those interested in the current state of research into Schistosomes and their control, this is a worth-while compendium.

TEXTBOOK OF PATHOLOGY: WITH CLINICAL APPLICATION by Stanley L. Robbins, M.D. W. B. Saunders Co., Philadelphia, Pennsylvania, 1962, 1190 pp., $19.00.

Reviewed by: LOUIS H. NAHUM

The first edition of this book in 1957 was received virtually with acclaim. It was preferred by most medical students who appreciate the presentation of the subject matter in logical, concise, and readable fashion. In this edition the student will find these qualities even more closely approached. All authors of textbooks struggle to incorporate in their revisions the new body of knowledge that has accumulated over the past years without adding bulk to the text. This the author has achieved admirably. He has revised the bibliography to include the best of the most recent literature but has retained some of the most magnificent and unmatched writings of the past.

The general organization of the book into thirty-two chapters, the type format and the orderly presentation of individual subjects of the first edition have fortunately been retained. The author wisely did not yield to the all-too-human temptation to indulge in change for its own sake. Professor Joseph Foley rewrote the chapter on the nervous system and Irving Glickman, the chapter on the oral cavity. G. Kenneth Mallory rewrote the liver section and Herbert Mascon, the skin. Sir Robert Cameron is a new contributor on inflammation and repair, and Tom Symington is a new contributor on the adrenal gland.

The author is fully aware that the pathologist is interested not only in the recognition of structural alterations but in their clinical significance. It would not surprise this reviewer if Professor Robbins attended ward rounds to contribute to the clinical consideration of the patient. Here he must have learned from the clinician that some clinical pictures are caused by biochemical changes not recognizable under the microscope such as hypocalcemia or psychosomatic disturbances. It is in the clinic that the sharp delineations between pathology, biochemistry and physiology become blurred and indistinct.

This text is remarkable in other ways. Standing out in many of its pages is the feeling that pathology stands on the threshold of great advances. Ultra structure is revealed by fantastic biochemical and biophysical techniques and instrumentation which probe the individual cell and its intimate structure and function down to the molecular level. The new methods of ultraviolet absorptiometry, interference microscopy, microdensitometry while heralding the future is very much in the minds of the various contributors and the student gains the feeling that there is great promise for a rapid expansion of our knowledge in the near future. What perhaps would have added bulk, but this reviewer misses, is a historical perspective, for in medical history one of the prime delights is the models of precise description and clear deduction which is worth much to the beginner in a medical science. However, if the student will follow the bibliography he will be rewarded in this regard also.

INTESTINAL BIOPSY: Ciba Foundation Study Group No. 14. Madrid, May 23, 1962. In honour of Professor C. Jiménez Diaz. A. C. Frazer, Chairman. Edited by G. E. W. Wolstenholme and M. P. Cameron. Little, Brown and Company, Boston, 53 illustrations, 120 pp., $3.50.

Reviewed by: MARTIN H. FLOCH

The Ciba Foundation Study Groups are valuable contributions to medicine in that they bring together a group of international specialized scientists to present and discuss salient topics. This particular study group on intestinal biopsy is of additional importance for it has resulted in the first major monograph in this new and exciting field. Intestinal biopsy has become a significant procedure since the advent of per-oral biopsy methods in 1956. This publication now brings forth the ideas and work of some of the major investigators in the field. It is a composite of six presentations, each followed by an interesting discussion by the panel of experts, and finally a general discussion at the end of the presentations which is moderated by the inimitable A. C. Frazer.

The opening paper is presented by C. C. Booth of Great Britain, and it stresses the importance of the dissecting microscope appearance of per-oral biopsy specimens. The authors and discussers point out that a biopsy specimen often presents a diagnostic picture when viewed under the dissecting microscope. Any confusion in interpretation of routine light microscopy sections is usually clarified, and a true three-dimensional picture of the villi are seen by this method.

Dr. Margot Shiner of Great Britain presents the second paper on the electron microscope appearance of the mucosa. The report clearly demonstrates the fine structures of the epithelial cell, such as the microvilli. The appearance of fat particles in the cell are demonstrated during absorption in normal and celiac sprue patients. This opened a very delightful and learned discussion on the mechanisms of fat absorption.

The third and fifth presentations of Dr. C. M. Anderson of Australia, and Dr. W. C. McDonald of the United States are excellent documentations of the effects of gluten upon the mucosa of celiac sprue patients. Their separate works point out the variability that exists in the correlation of degree of pathology and clinical complex. However, they clearly emphasize the importance of gluten as an etiologic factor in causing damage to the mucosa within three to six hours after intake in a susceptible celiac patient. The possibility that mucosal lesions exist in asymptomatic relatives of celiac patients is brought forth by Dr. McDonald.

Dr. A. C. Frazer presents the fourth paper. It is an excellent concise review of our knowledge of the effect of mucosal damage on absorption in man. Some of the chemical breakdown products of wheat and gluten are reviewed and their effects on celiac mucosa are discussed.

The final paper by Dr. S. J. Baker of India reviews the biopsy findings encountered in tropical sprue in South India. This should not be confused with the syndrome described in Puerto Rico and the West Indies. Dr. Baker's patients apparently do not respond to folic acid, whereas the patients from the West Indies invariably improve on folic acid therapy. This presentation is somewhat confusing for the control biopsy group of patients show consistent abnormalities forcing the authors to conclude that the intestinal biopsy is of limited value in South India. Unfortunately much of their evidence is based on the dissecting microscope appearance rather than the conventional light microscopy sections.

The monograph is concluded with a discussion by all the participants in which many "gems are dropped" that should be of interest to most investigators in this field. The book itself is interesting reading, is well edited, and a contribution by virtue of its being a "first" on intestinal biopsy. It should be on the reading list of all physicians interested in the fields of gastroenterology or pathology.

HYPERTENSION VOLUME X Neural and Renal Mechanisms. Proceedings of the Council for High Blood Pressure Research. American Heart Association, Cleveland, November 17-18, 1961. Edited by Floyd R. Skelton., 18 contributors, 96 pages, American Heart Association, Inc., New York, 1962.

Reviewed by: LOUIS H. NAHUM

This is a beautifully printed small volume which begins with a story of hypertension research "From Bright Toward Light" by George E. Wakerlin. Then a paper on neural factors responsible for cardiovascular regulation by Eric Neil. Mechanism of the carotid sinus in experimental hypertension by Paul Kezoli. Then chronic experimental hypertension in dogs after constriction of the bronchocephalic and left subclavian arteries. Then another on Carotid Sinus Compression in Dogs. Then follows six papers on the renin angiotensin system and finally, a paper by Harriet Dustan on some aspects of occlusive renal arterial disease in man.

This excellent volume is for sophisticated cardiologists and physiologists of the circulation. It provides basic data in hypertension so that one's outlook is broadened but it does not deal with any problems of therapy.

MIDWIFERY PRINCIPLES AND PRACTICE FOR PUPIL MIDWIVES by R. Christie Brown, Donald Fraser and Richard H. Dobbs, M.D. Edward Arnold Publishers Ltd., London, The Williams & Wilkins Co., Baltimore, Maryland, 1962, 573 pp. $8.50.

Reviewed by: ORVAN W. HESS

This book has been authored by prominent British Obstetrical Surgeons. It represents the fifth edition since its initial publication in 1940. The format is quite standard. The illustrations are mainly black and white drawings. A few photographs of congenital defects are peculiarly placed in the last chapter which is devoted to the history of midwifery and is most interesting. The influence of recent advances in genetics is noted in chapters dealing with fetal development. Chapter Seven entitled "Ante-natal Pediatrics" touches on mechanisms affecting the growth of the fetus during its intra-uterine environment. Presumably these factors are analogous to those which are basic for good pre-natal care. If the title "Midwifery" is accepted according to its common connotation in the United States and it is the intention of the authors to provide a textbook for "student midwives" the reader potential here is quite limited since few schools exist for legitimate training for licensure to practice as a "midwife."

HANDBOOK OF PSYCHIATRIC TREATMENT IN MEDICAL PRACTICE by Nathan S. Kline, M.D. and Heinz Lehmann, M.D. W. B. Saunders Co., Philadelphia, Pennsylvania, 1962, 124 pp., $3.50.

Reviewed by: LOUIS H. NAHUM

The present volume is a practical guide to the doctor who encounters and must treat psychiatric patients. It does not cover psychiatric theories in any form but it does provide some insights into the fundamentals. The book is built around answers to specific questions which are frequently asked by psychiatric colleagues. The answers are brief, uncluttered and quite informal. The book begins with a consideration of who should give treatment, doctor or psychiatric specialist, and outlines when a patient should be referred to a psychiatrist.

The second section deals with who should be treated and what types of patients a physician should not undertake to treat. Then follows a section on some general principles of treatment. It deals with objectives, prognosis, drugs to be used and when they should be discontinued. The next section presents treatment of specific disorders such as depression, schizophrenia, cerebral arteriosclerosis and senile psychosis, neurosis, anxiety and alcoholism. The appendix follows with specific psychopharmacologic agents and recommended dosage and physiological side effects. A rather good index completes the handbook.

The book though loosely written and dogmatic will be appreciated by the general practitioners who need more insight into psychiatric disorders and specific guidance in individual problems.

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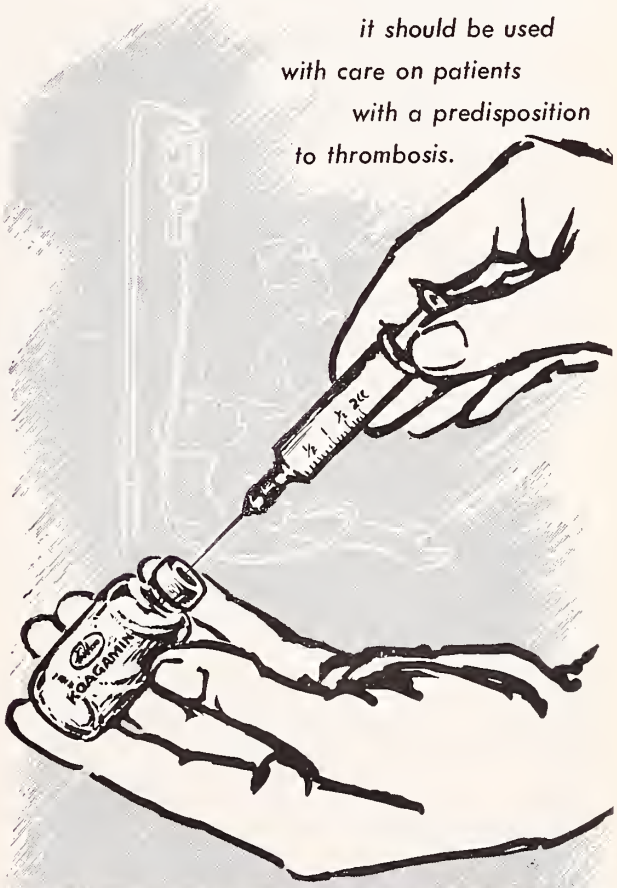

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GYNECOLOGY AND OBSTETRICS by John William Huffman, M.D. W. B. Saunders Co., Philadelphia, Pennsylvania, 1962, 1190 pp., $28.00.

Reviewed by LOUIS H. NAHUM

There are advantages and disadvantages for one author to produce a textbook on any medical subject. The disadvantages are the difficulty which one author must experience in covering a large subject such as obstetrics and gynecology in depth. In fact, no less an authority than Herbert Evans has stated that it is no longer possible for one person to cover the whole field of a given science. If, however, the author attempts to portray not in depth, but in principles what happens to the female genitalia during life as regards the normal and abnormal changes, and why these changes occur, then he can portray sequential development, physiologic processes, and morbid affections as excellently as his ability and experience warrant. He can do so because he sees the subject as a unit. From his own experience he can either eliminate or stress certain points. He can reduce the reduplication of subject matter which often occurs when many contributors join together in one project.

Dr. Huffman who is Professor of Obstetrics and Gynecology at Northwestern University Medical School clearly has the ability and great experience needed to produce an excellent textbook for the student. He has produced a summation of accepted present day concepts of gynecology and obstetrics. In fifty-two chapters he has covered the whole range of both subjects in accordance with accepted principles of physiology and morbid anatomy of the growth and regression of the genitalia. In this sense what is presented in this book is new. It is also valuable because the reader is able to integrate the age of the female from conception to senescence with the steps in the development of the genitalia, the physiologic processes which they manifest and the morbid conditions which affect them. It has excellently avoided mechanical exposition of principles guiding the health of women. Instead it has its foundation in biology and covers completely the natural history of woman.

Although treatment is described and is based on the principles which guide gynecologic and obstetric management, and indications and contraindications to surgical procedures are discussed, technical details and illustrations of the operations are omitted. Presumably in part this is due to the fact that the book which is already large would become unwieldly. But in part it is also due to the author's belief that the place to learn how to perform an operation and develop surgical skills can be acquired only in the delivery and operating rooms. It is thus clear that this book is oriented to the student of medicine. Residents who plan to enter the special field, will still need a book describing in detail the steps and procedures in operations although admittedly the use of his hands or his instruments cannot be taught except at the work bench of the specialty.

Each chapter is followed by a well chosen set of references with titles and an excellent detailed index of sixty-seven pages completes this handsome volume. The book will without doubt be accepted as an excellent text to be used by students everywhere both here and abroad.

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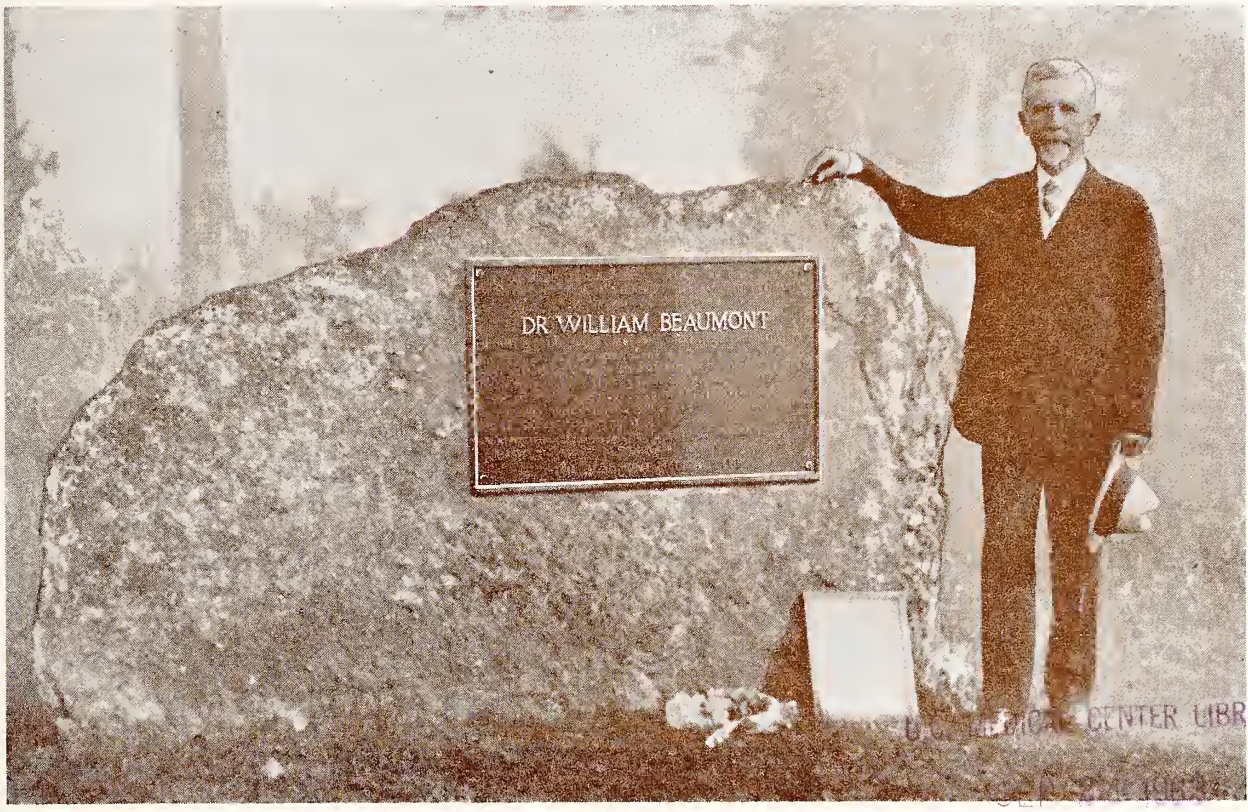

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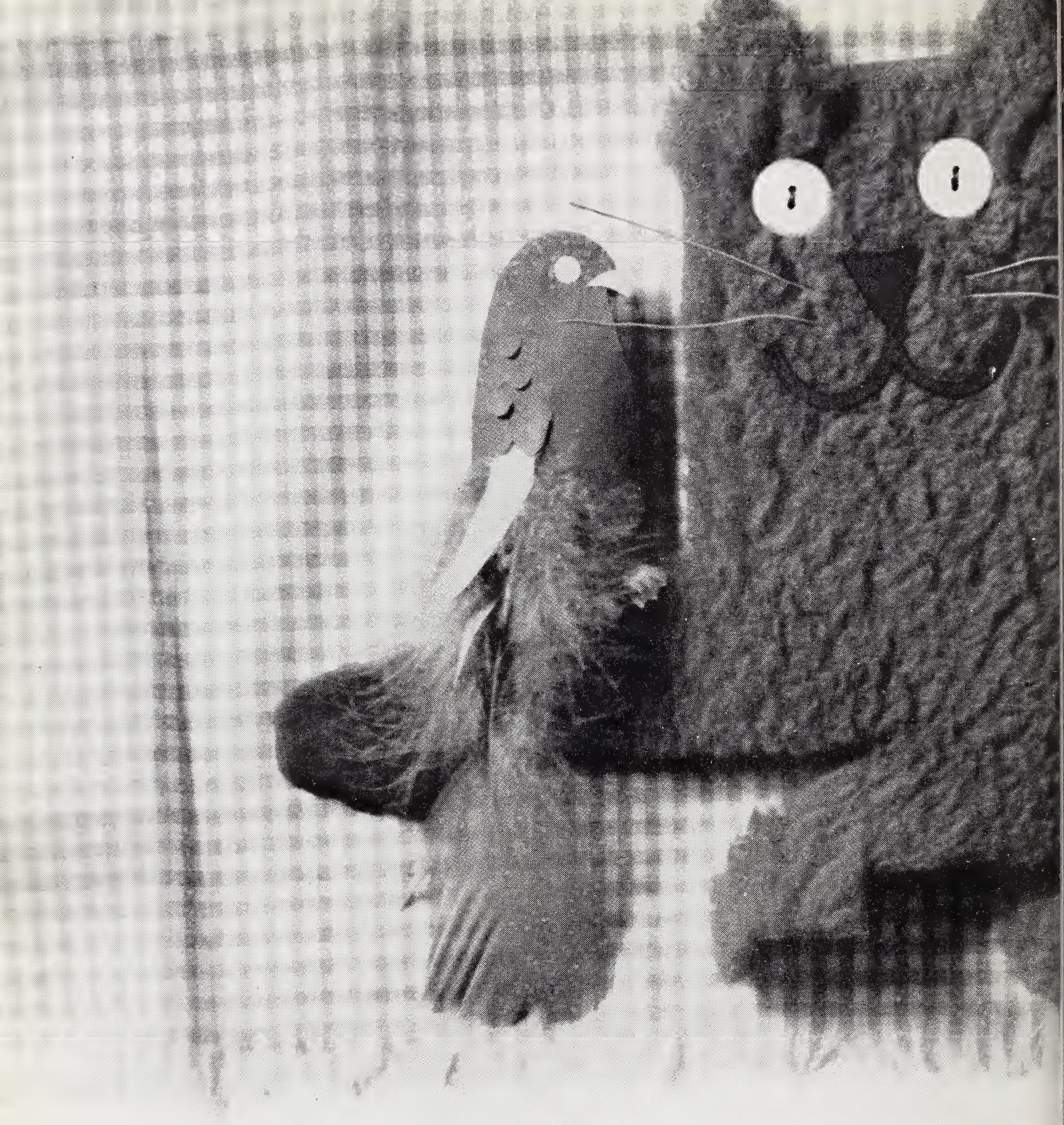

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The Connecticut Clinical Congress: Radioisotopes

Radioisotopes are being widely used in clinical medicine. Last year in this country, radioisotopes were administered to hundreds of thousands of patients for diagnosis of various conditions affecting almost every organ of the body and also for therapy in a variety of diseases. There is no doubt that the clinical use of these radioactive materials will greatly increase in the coming years. In Connecticut, many hospitals already have radioisotope units, and additional units will be established in other hospitals within the next few years. It is, therefore, important that every doctor be informed regarding the medical aspects of radioactivity and the clinical applications of radioisotopes.

Because of the increasing importance of radioisotopes in clinical medicine, the Thirty-Eighth Connecticut Clinical Congress to be held in New Haven on Friday, September 27, will be devoted entirely to this subject. The program, which is published elsewhere in this issue, has been designed especially for the practicing physician who desires practical and up-to-date information regarding the clinical applications of radioisotopes. The morning session will provide a general review and discussion of important basic principles; it will serve as an introduction to the afternoon panel which will discuss the use of isotopes in diagnosis and treatment of specific disorders. It should be of interest and of value to every doctor in the State.

Arthur Ebbert, Jr., m.d.,

The Process Of Socialization And Its Meaning To The Human Race

Scott[1] describes an experience with a female lamb taken from its mother at birth and raised on a bottle for the first ten days of its life. When it was then placed out to pasture with a small flock of domestic sheep, it acted surprisingly independent of the rest of the flock and three years later it was still following an independent grazing pattern. When it was mated and had lambs of its own, it became a very indifferent mother. It allowed its offspring to nurse but showed no concern when the lamb moved away with the other members of the flock. Following the flock is a universal characteristic of normal sheep so that the extensive and permanent modification of behavior that resulted from a brief early experience was most impressive. The results suggested that Freud was right concerning the importance of early experience and pointed to a critical period in behavioral development.

There is a considerable body of evidence supporting the view that a critical period for determining early social relationships is a widespread phenomenon in vertebrates. Such a critical period has long been known in ants. Freud called attention

THE COVER

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On Lebanon Green not far from the Beaumont State Highway stands this boulder from the Beaumont Farm memorializing Dr. William Beaumont. At the dedication ceremony on June 29, 1926 the principal speaker was Dr. Russell H. Chittenden of Yale, shown here. The inscription reads,

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to the importance of early experience in the origin of neuroses at certain periods in the life of an infant which are times of particular sensitivity. In 1935 Lorenz[2] found critical periods for the formation of social bonds in birds. Scott in his review of this rapidly growing field discusses three major kinds of critical period phenomena. One involves optimal period for the formation of basic social relationships, one a critical period for infantile stimulation, and one the optimal period for learning. Undoubtedly there must be others.

There appears to be an astonishing degree of flexibility in behavioral development depending upon when a major development process has matured. How to discover the time of onset of a critical period and the time when it has come to a close would appear to be of the utmost importance in studying the problem. Thus to understand the process of socialization in any particular species would require a systematic study of the development of the various capacities which affect the time of onset and the duration of the critical period. This would include knowledge of sensory and motor learning capacities as well as the ability to perform the essential patterns of social behavior. A very immature animal cannot maintain contact by following, so that slowly developing animals like altricial birds such as jackdaws and doves form their social habits much later than precocial species. In the human infant whose adult motor patterns develop late, nevertheless the process of socialization begins early because the infant makes his contract by visual exploration and by smiling response to human faces.

It was at first thought that the process of forming social attachments begins with food rewards. In the dog food rewards per se are not necessary for the process of socialization, because underfed puppies become more rapidly attached to the handler than do well-fed ones. Whether the animals are fed by hand or machine seemed not to matter provided they each receive the same degree of human contact. In fact even punishment during feeding was not a determinant forming social bonds, since Fischer[3] showed that puppies that were both rewarded and punished seemed to show the most attraction and dependency behavior with respect to the experimenter. Apparently any sort of strong emotion whether it is hunger or fear or pain or even loneliness will speed up the process of socialization.

On the other hand contact is of extreme importance in the process of socialization. Harlow's[4] famous experiments with rhesus monkeys isolated at birth and supplied with dummy mothers, showed that when given a choice between a comfortable cloth covered mother without a nipple and an uncomfortable mother made of wire screening but equipped with a functional nipple, the young rhesus monkeys definitely preferred cloth covered models from which they had received no food rewards. When given an opportunity to choose from various kinds of mother models, comfortable and uncomfortable with and without nipples, the animal chose a comfortable mother model with a nipple. Thus although food rewards do contribute something to the social relationship they do not seem to form its prime basis.

Scott concludes that the speed of formation of a social bond is dependent upon the degree of emotional arousal irrespective of the nature of that arousal.

Since an important part of forming a primary social relationship appears to be emotional arousal while the animal is in contact with another, it is obvious that the critical period for socialization could be timed by the appearance of behavioral mechanisms which maintain or prevent contact and indeed this is the case. There are positive mechanisms from species to species which bring young animals close to other members of the species; the clinging response of young rhesus monkeys; the following response of chicks, ducklings, lambs and other herd animals; the social investigation, tail wagging, and playful fighting of puppies; the visual investigation and smiling of the human infant. These of course, must and are accompanied by interacting responses from adult and immature members of the species such as; holding and clasping by primate mothers, brooding of mother hens and other birds, calling by mother sheep, investigation and play on the part of other young puppies, and the various supporting and nurturing activities of human mothers.

What kind of animals are they that were raised on dummy mothers after they have reached maturity? Harlow[4] observed the behavior of such animals towards their own young after mating. They become uniformly poor mothers neglecting their offspring and punishing them when they cry. Such rejection in no way however, inhibits formation of a social bond, since we see the young rhesus infants desperately crawling towards their mothers and giving every evidence of becoming attached to them although perhaps not as strongly as in the normal. Apparently the dummy mother offers inadequate supporting and nurturing activities which seriously and permanently alters the character of the offspring.

If contact and emotional arousal result in social attachments, are there present negative mechanisms which prevent such attachments once the critical period is past? Perhaps the most widespread of these negative mechanisms is the development of the fear

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response which causes the young animal to immediately leave the vicinity of the stranger and hence avoid contact. This fear response is almost universal, being found in young chickens, ducklings, dogs, rhesus monkeys and many other birds and mammals. Even in children there is a period between the ages of five to twelve months in which there is a mounting fear of strangers sometimes called "eight months anxiety."

Apparently one of the factors that brings the critical period of socialization to a close may be the developing ability of the young animal to associate fear response with particular stimuli. If the developing of an escape response to strangers could be held in check then perhaps the critical period might be extended indefinitely. Fuller[5] in fact reports some successes in socializing puppies that were raised in isolation boxes during the critical period. This inhibits the development of the escape response. The fear they show on first removal from their cages could be overcome by careful handling or through use of tranquillizing drugs. Fear responses thus have a dual effect. They facilitate the formation of the social bond during the critical period (along with other emotions) and they bring the critical period to a close, by developing fear of strange animals.

The rapid formation of emotional bonds is not limited to young animals. It is recognized in the rejection of strange young by adult sheep, goats and many other herd animals. In these species the mothers become strongly attached to the young within a few hours after birth and refuse to accept strangers thereafter.

This field concerned with the formation of affectional bonds in adult life is just beginning to open up. We know that many birds form strong pair bonds which are maintained as long as both members survive. Certain species of mammals such as foxes seem to form long-lasting mating bonds. Can it be that strong emotional arousal which is so important to the primary socialization of the infant, also contributes to the formation of the sexual bonds, and the emotional arousal which accompanies the birth of the offspring is responsible for the rapid formation of the social bond in a mother towards its infant? In short it seems likely that formation of a social attachment through contact and emotional arousal is a process that may take place throughout life, but that it takes place rapidly during certain critical periods and varies with the intensity of the emotional arousal.

In infancy it takes place as a result of specific kinds of emotions associated with food rewards and contact comfort. But even aversive emotions in infancy appear to produce the same effect as those that we think are rewarding, although the positive effects of unpleasant emotions is normally limited to early infancy before the escape reaction has developed.

The consequences for human behavior of the above experiments are that it provides an explanation of certain well-known clinical observations such as the development of strong affection for cruel and abusive parents by neglected children, as well as an explanation of the indifference of some parents for their own infants if they have been improperly socialized in their own infancy. More knowledge of proper socialization methods in humans, should bring to light how we can improve the behavior of the human animal so that there will be less aggressive destructive behavior and more affectional bonds to other human beings.

L.H.N.

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New Hearts For Old

It is now possible to transplant the heart from one dog to another host animal from which the heart has been excised. The donor heart occupies the same locus in the host that it occupied in the donor animal. It is obvious that to accomplish this extraordinary feat, it was necessary to achieve a high degree of surgical skill and to be able to preserve the heart during its extracorporeal phase. Unlike the skin and kidneys the heart is not a paired organ and special precautions must be taken when the coronary circulation is interrupted. According to Lower[1] and associates simple immersion of the heart in physiological saline at 0-4° C. will enable the heart graft to recover and to sustain the circulatory burden even though it has been anoxic for as long as seven hours. This length of time is certainly within the limits of practical cardiac homotransplantation.

The question at once arises whether a heart separated from the nervous system can function adequately. According to Egdahl, the Russians believe that no organ can function satisfactorily without the central nervous system connections. There are investigators in this country who also hold to this opinion. Thus Cooper et al[2] who have

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studied the effects of external denervation of the heart, have concluded that a significant change occurs in the chemical environment of the myocardium, and Willman et al believe that total separation of the heart from its nerve supply is incompatible with consistent long term survival of animals. Further studies from Hurley's[3] laboratory however showed that the physical responses in dogs with transplanted heart, though impaired, were clearly adequate to sustain life for as long as eighteen months. Whether the nervous regeneration has or can take place in such preparations still remain to be determined. However if the animal is unable to make adequate adjustments to the requirements of day-to-day living an intensified study of cardiac homotransplantation would seem to be unjustified. Perhaps a large number of experiments may show that total separation of the heart from the nervous system will not prevent long term survival of the host animal.

A more serious problem for long term survival of the transplanted heart is the immune response, a factor not taken into account in the original series of isotopic cardiac homografts. No effort was made to modify the response of the host animal to the homograft and the immune response in every case led to the destruction of the heart graft. The average survival of these dogs was ten days. In each animal death resulted from severe myocarditis and under the microscope many plasma and wandering cells could be noted in the sections of the rejected myocardium sufficient to cause actual obstruction of the circulation at the capillary level.[4] These large mononuclear cells which assembled at the site of the homograft appeared to come from local lymph nodes. It is obvious that unless some way could be found to suppress the immune response in homotransplantation, that the future would hold no practical hope of replacing a new heart for an old one.

The mechanism in the body which causes rejection of homografts must first become known before its modification could even be imagined. Perhaps the most exciting contribution in the field of transplantation research has been the recently elucidated function of the thymus gland by Miller et al[5] in England and simultaneously by Good[6] in this country. The thymus gland apparently functions as the master gland of the reticulo-endothelial system. It liberates immunologically competent cells into the lympho-reticular network. If thymectomy can be performed before the system is replete with immunologically competent cells, then the host can be made susceptible to homografted tissue. It has been known for some time that patients with an incompetent lymphorecticular system lack strong immune responses to homografted skin.[4] Individuals whose reticulo-endothelial system is destroyed by X-rays or by chemicals can accept homografts with long term survival. Uremic patients and patients with Hodgkin's disease where the lymphatic system has been permeated with neoplasm will retain skin homografts longer than normal individuals and so will patients with agammaglobulinemia. However a simpler way than thymectomy or destruction of the lymphoreticular system will have to be found before homotransplants can be considered a practical reality.

One possibility suggested by the work of Pierce and Varco[7] is the method of chemical suppression of the immune response by 6-mercaptopurine. With this agent the authors found that dogs could be weaned from the immune suppressive agent in renal homografts. Another possible method is that suggested by Shumway[4] of finding animals which are histo-compatible through identifying the leukoagglutinins of red cells and white cells. Then, host-donor groupings might be developed. No doubt the purest method for inducing homograft tolerance would be host preparation with a transplantation antigen. But this would take much time and in the case of heart grafts some method would have to be found for very long term preservation.

All this sounds like a dream, too far removed from reality. Nevertheless we are at the threshold in which experimental transplantation of the heart will soon reach the status of clinical renal homografts. The surgical methods for grafting the heart is available. Extracorporeal survival of the anoxic heart for sufficient duration to effect the transplant is permitted by cooling of the graft. Total extrinsic denervation does not interpose a prohibitive obstacle to cardiac transplantation. The single remaining obstacle—the immune reaction of homograft rejection have been attenuated frequently enough to predict ultimate success in the laboratory for the heart homograph. Is it too bold to dream of any clinical implications of cardiac homotransplants, of changing new hearts for old? Admittedly this is a look much too far into the future. But it is a bold clinical adventure and might be productive of imaginative surgical and immunological advances of great consequence.

L.H.N.

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Science Tools: (2) The Thermogram

The first "thermograph" a record of invisible infra-red wave lengths on paper was successfully recorded a century and a quarter ago by Sir J. F. W. Herschel.[1] Today we know that every object emits infra-red radiation and if infra-red cameras of sufficiently high sensitivity are available, then thermograms can be made of any object of interest. It should be emphasized that they are not infra-red photographs which have to be illuminated by an extraneous source. On the contrary, thermograms can be taken in total darkness, since they are photographic reproductions of infra-red radiations of longer wave lengths emitted by the object itself. They are truly heat photographs and are capable of yielding information regarding the temperature of the objects surface. There are now available infra-red cameras which yield a two dimensional record of the infra-red emission and the hotter the object the whiter is its image. In fact the sensitivity of the camera can be varied to recognize a difference of less than 1° F.

For all practical purposes all humans emit radiation in the long wavelength infra-red region as if they were black bodies, so that the surface of the human body is an ideal subject for thermography. When special filters are used to eliminate shortwave lengths, thermograms of the human body are true quantitative thermal maps of the skin. However, it must be borne in mind that the actual temperature of the skin at any one time is influenced by many processes such as vascular reactivity within the skin itself, thermal conduction from both locallyzed and diffuse heat sources within the body, insulation of clothing, heat losses by evaporation or perspiration, air currents, and the radiant energy exchange which is constantly taking place between the skin and the surrounding environment. However, if you remove the clothing and allow the subject to remain at rest for ten to fifteen minutes in a cool room of constant temperature, free of air currents, and avoid having any object appreciably hotter or colder than the room air, then the primary heat source for the skin is the heat conducted to it from within.

Normal human skin is such a perfect emitter in the long wave length, that it is not possible to make it appear hotter in the thermogram by foreign substances applied to it like lipstick, rouge, nail polish etc. As might be expected, high vascularity elevate skin temperature so that skin above veins, hematomas, bruises and infections, appear hotter than normal. Skin over areas of low vascularity such as heavy scar tissue, uninfected cystic lesions or a ganglion appear colder than normal. Fat is a poor thermal conductor and a good insulator as compared with muscle, and so the thermogram appears cool over fatty concentrations. The skin over bony structures or knuckles and knee caps also appear cold because of the absence of highly vascular tissues just beneath the surface. Recent fractures on the other hand appear hotter than adjoining areas.[1]

It is clear that thermograms made under controlled conditions could yield information of considerable diagnostic value. Lawson[2] observed two cases of metastatic breast cancer in which the skin overlying the affected areas was definitely hotter than that of surrounding areas. In one of cancer the overlying skin appeared to be hot while in the case of a cyst the skin temperature appeared to have been lowered. Williams et al[3] have reported on an extensive series of infra-red studies of a hundred patients each with a lump in the breast, abscess, carcinoma fibroadenoma all of whom showed a rise in skin temperatures over the lesion, while cyst, adenosis or duct stasis showed no rise in temperatures.

The overall potential of thermography as a diagnostic tool is still to be determined. Barnes[4] reports a patient with appendicitis in which the skin over the appendix showed evidence of inflammation underneath hours before the clinical picture became definitive. A team of investigators at Albert Einstein Medical Center directed by Dr's. Gershon, Cohen and S. H. Berber are collecting data on thermography in all possible conditions. Soon we will know whether abscesses elsewhere and tumors elsewhere than in the breast will show higher skin temperatures over them. A thyroid nodule, brain abscess, subphrenic abscess, perirenal abscess, pelvic abscess are but a few that come to mind. We are not merely in an era of knowledge explosion but technological revolution as well. Let us hope man will learn to use this knowledge for constructive not destructive purposes.

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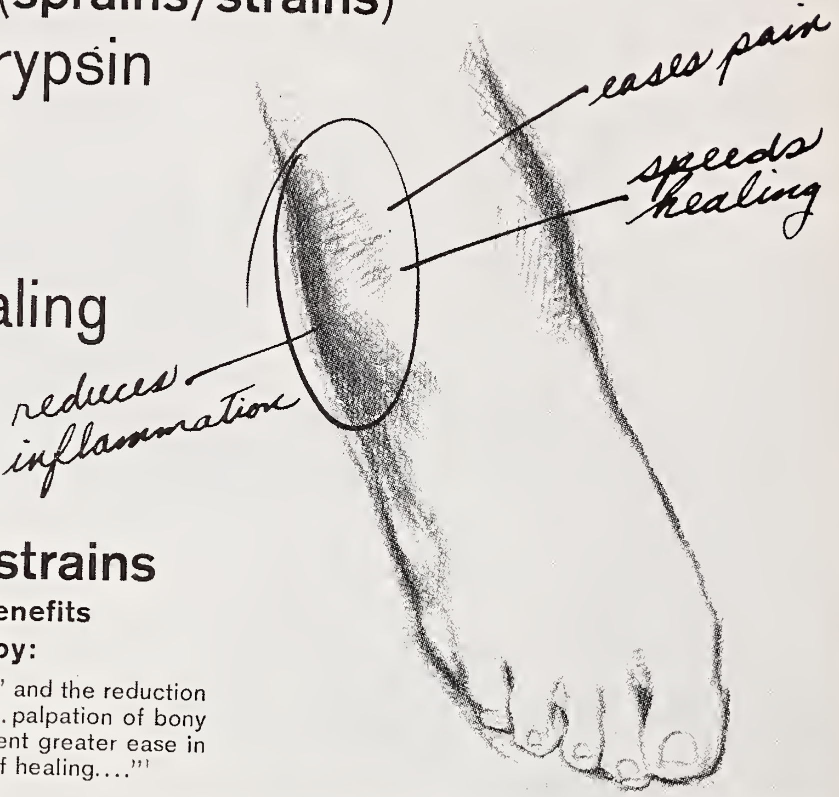

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Side Effects and Precautions: Side effects with Parenzyme [trypsin] are rare. Prolonged use occasionally causes itching and rash which may be relieved by antihistaminics. Local pain and induration at the site of injection may occur. The usual precautions should be observed as for the injection of any protein material. As a precaution, patients should be observed for about 15 minutes following an injection of trypsin. Epinephrine Injection, U.S.P. 1:1000 should be on hand for any systemic reactions.

Supplied: (1) In sterile **multiple dose** vial containing lyophilized trypsin 62,500 Units, N. F. (25 mg.), plus 5 ml. vial of aqueous diluent. (2) In sterile **single dose** vial containing lyophilized trypsin, 12,500 Units, N.F. (5 mg.), plus 1 ml. vial of aqueous diluent.

Compatibilities: There are no known incompatibilities for Parenzyme [trypsin] or Orenzyme. Other medications may be given with these preparations, if indicated. In infection, appropriate antibiotic therapy should be used concurrently.

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The Relief Of Gaseousness

Elsewhere in this issue is a paper on relief of gaseousness. Any study of therapy in relation to such a nebulous symptom complex must be carefully controlled. Despite the obvious difficulties involved, a noble attempt has been made that is published in this issue.

Patients were accepted for the study if they persistently complained of gaseousness. Alternating cases were given either active or placebo tablets of identical appearance for two weeks. The tablets were then reversed in each subject for another two weeks. Neither the patient nor the investigator knew whether medication was active or placebo until the study was complete. The only criterion of success was the patients statement that he had or had not complete relief of gaseousness in a two-week trial. Such a simple criterion for the initial evaluation and for successful therapy can only be used if strictly double blind techniques are maintained.

Unfortunately, the results of the study are of very restricted value since they do not tell us whether or not silicone or silicone activator or digestive ferments or any combination of these are responsible for any effects.

Paul H. Lavietes, m.d.

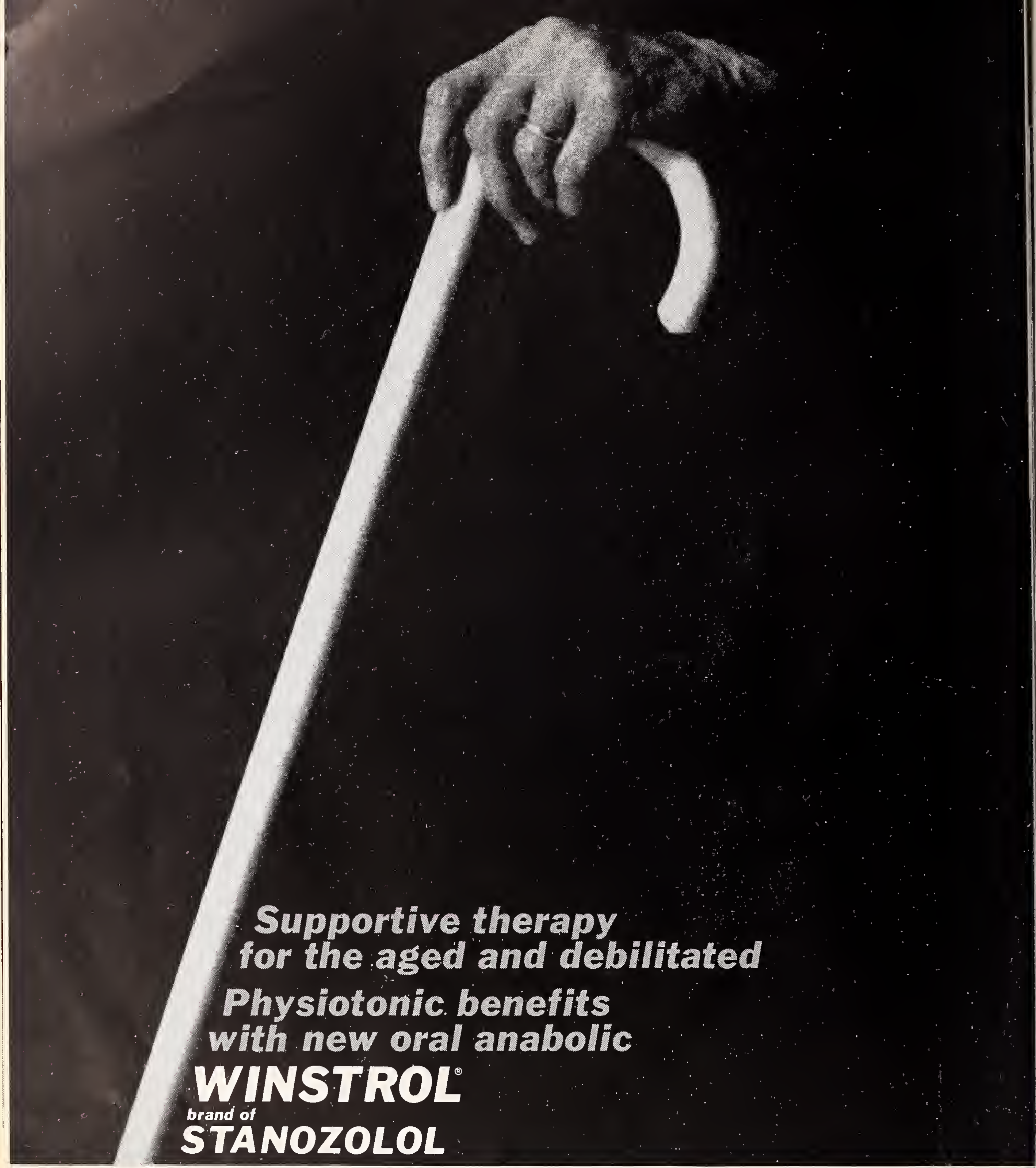
Hearts That Need A Second Chance

We read now frequently in the literature of instances in which patients with fatal heart attacks have been successfully resuscitated. For example, Kouwenhoven[1, 11] and his colleagues report successful closed heart resuscitation in seven of twenty-eight cases of cardiac arrest in the presence of myocardial infarction, a salvage rate of 25 per cent. We must assume from these and other experiences that a fatal outcome in acute heart disease is not necessarily associated with extensive damage which is incompatible with life. There are hearts that are too good to die and need only a second chance.

The extent of the possibility of salvage is brought home to us by Yaters[2] studies on 950 men in the armed forces who died of coronary artery disease in which more than half of those under fifty had no myocardial infarcts. Adelson and Hoffman[3] studied hearts in 500 consecutive sudden deaths attributed to coronary artery disease and found that ⅔ had no recent anatomic damage and ¼ had neither recent nor old occlusions. Frequently, a fatal outcome is associated with only minimal pathologic change or patchy ischemia. There is thus an important fact beginning to emerge in our experience with acute fatal heart attacks that perhaps a goodly proportion are reversible if one can reach them soon enough. The real extent of the possibility of restoring life can be gained from extrapolating the figures above to the total number of myocardial infarctions occurring annually as Dotter[4] et al did. They estimated that 100,000 could be saved if resuscitative methods and a trained team were immediately available.

We are no longer in need of physiologic knowledge concerning the two causes of cardiac asystole—arrest or ventricular fibrillation. Neither are we in need of adequate methods of resuscitation. A greatly simplified and practical technique is now available. Successful resuscitation by both open and closed heart cardiac massage has now been well established and it appears that the closed heart chest method yields a higher aortic pressure than the open heart one. The former eliminates or reduces myocardial trauma that is associated with direct manual systole. Thal et al[5] reported adequate closed chest massage in forty-six patients, none of whom showed rupture or myocardial injury. On the other hand, in an open chest massage study on sixty patients there was moderate to severe contusion of the heart in almost half.[6] Obviously ventricular fibrillation will not disappear with massage but will require defibrillation. An excellent instrument the cardioconverter designed by Lown[7] et al has removed whatever threat of injury by a.c. defribrillators that existed. What is needed now is appropriate case finding in sufficient time, so that a trained team with available instruments can perform the resuscitation expertly.

Available time for successful resuscitation is of primary importance, because there is a maximum permissible time limit for the institution of cardiac massage, beyond which the recovery of the central nervous system is impossible. The best available evidence suggests the critical interval to be somewhere between three to five minutes, although age may play a role in the tolerance of the central nervous system to oxygen deprivation.[8] On the other hand, Schlosser and Grote[9] from their experience with nine cases of cardiac arrest believe the critical time is very short as little as one minute. It



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Dosage: Usual adult dose, 1 tablet t.i.d. before or with meals; women, 1 tablet b.i.d.; children (school age): up to 1 tablet t.i.d. dren (pre-school age): ½ tablet b.i.d. Available as scored tabl 2 mg. in bottles of 100. For best results, administer with a high pr diet.

WINTHROP LABORATORIES, NEW YORK 18

Marked improvement in appetite / Measurable weight gain Winthr is clear that patients that die suddenly outside of the hospital will probably remain beyond the possibility of salvage even though their hearts are too good to die, and only those in a hospital under careful, constant, scrutiny may have a second chance. It may be that we will learn more about reversing brain damage due to anoxia in the future, but at present we must operate on the premise that beyond three to five minutes of cardiac arrest the brain is not salvagable. We must set up our defenses in the hospital where getting to these patients is possible before the critical period of resuscitation has been exceeded.

Wilburne and Fields[10] have proposed a special unit for each hospital called the Coronary Care Unit. A special section of a hospital is set aside for the exclusive care of the acute coronary case. It consists of a strategically located monitoring and nursing station within prompt reach of each patient. There is a central multichannel physiologic monitoring system incorporating a continuous simultaneous oscilloscope, electrocardiogram, and digital readout display of arterial pressure and pulse volume. An electrical sensing device actuated by ventricular fibrillation, ventricular asystole and changes in ventricular rate and arterial pressure will initiate an audible and visual alarm in the form of a blinking red panel light. At each patient's bedside there will be a duplicate display panel with an outlet defibrillator connection. They recommend a closed circuit television monitoring system for the more critically ill patient. They describe a mobile emergency cart equipped with a defibrillator, an external cardiac pacemaker, an endotrachial tube, laryngoscope, a variety of drugs. Above all, they suggest the unit have an emergency alarm by buzzer signal or public address system from the coronary care unit to the physician skilled in cardiac resuscitation who can recognize arrest of the heart, initiate pulmonary ventilation, institute closed chest cardiac massage and operate positive pressure respiratory equipment. The authors further present detailed procedures for achieving cardiac restoration in most foreseeable contingencies.

It would appear that present practice of random assignment to various locations in a hospital, of patients with acute myocardial infarction is a therapeutically antiquated procedure. In principle the earlier coronary perfusion is instituted by external cardiac massage, the more likely will cardiac resuscitation be accomplished. Immediate availability of the service in a hospital as recommended by Wilburne and Fields is best calculated to save the hearts that need a second chance.

L.H.N.

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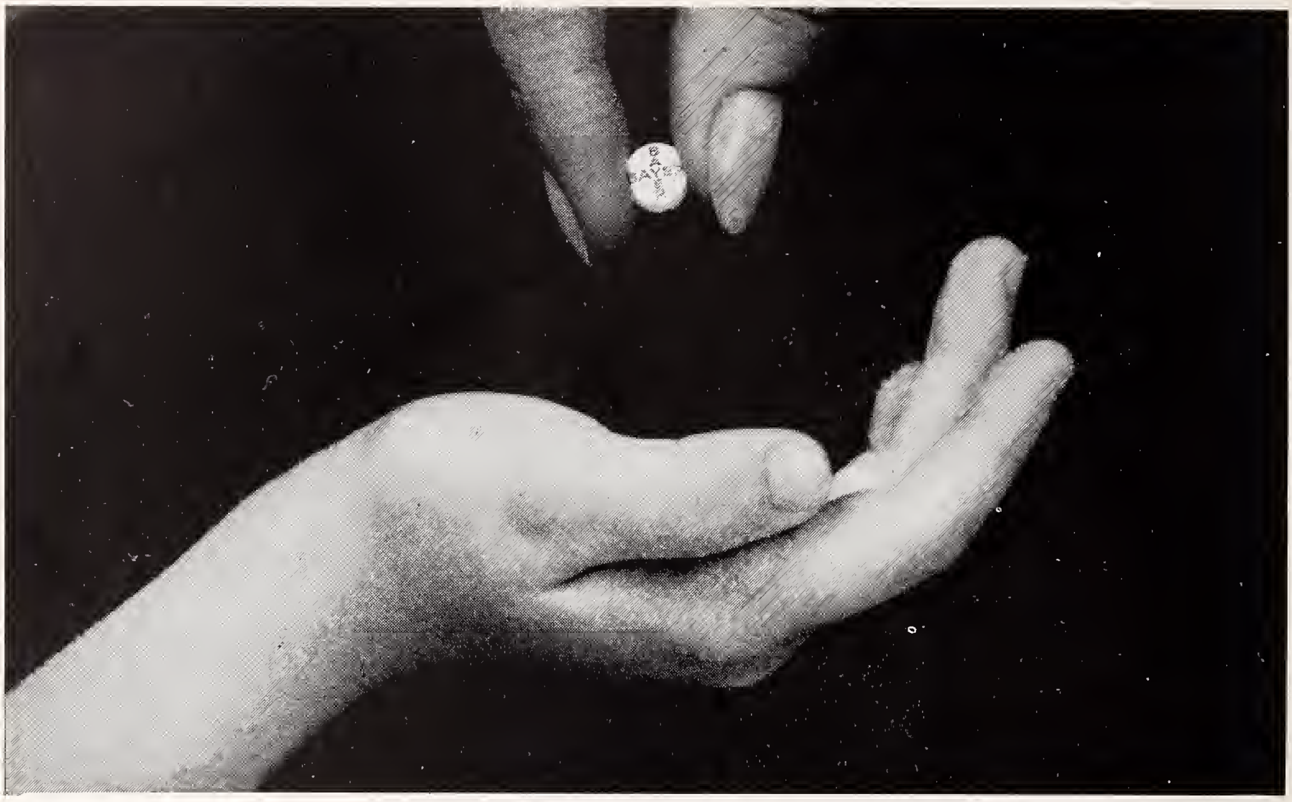
Fitness To Drive A Bus

Every time an auto accident is reported in the press, a considerable soul searching goes on in the doctors mind, in motor vehicle departments, and among commissioners of safety. Fortunately the clinical assessment of fitness to drive does not involve the development of yet another branch of medicine, because it is simply the application of clinical knowledge already at hand to the particular requirement of driving vehicles safely. As all doctors drive themselves they are in the fortunate and unusual position of having practical experience of both sides of the question, the doctor and the driver. Many adult patients are drivers who may seek advice on their physical fitness to drive during their convalescence or in relation to chronic disease. This kind of advice is especially important for professional drivers who may be responsible for the safety of many passengers. A general guide for physicians on the assessment of fitness to drive has been published by the American Medical Association (1959) as well as a booklet for the patient entitled "Are you fit to drive?"

In assessing the fitness of drivers one usually considers whether he will drive a public service



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vehicle in which many passengers are carried, or a heavy commercial vehicle or a private car. The reason for taking this into account is because the driver of a public service and commercial vehicle generally drives many hours a day, whereas a private car driver rarely drives that long if ever. Since the risk of accident due to a medical condition in a driver obviously increases with the time he spends driving, a higher standard of fitness is necessary for drivers of public service vehicles who also carry the responsibility of the welfare of their passengers. Norman[1] reports that London transport workers are medically examined at ages 50, 56, 62 and 64 and in 1959 of 2,630 drivers examined, 73 were found unfit of which 51 were of cardiovascular disease. Because of the painstaking care exercised in choosing their drivers only fourteen cases of loss of consciousness occurred among transport workers during 49 to 59 with 20,000 drivers. Fortunately although in twelve cases the vehicle was moving and in five there was no warning to the driver, only in three minor accidents resulted. This is an extraordinary record of safety because the minor accidents occurred without passenger injury in 220,000 driver years!

Occasionally, however, a disaster does occur as reported by Levy, de la Chapelle and Richards.[2] It concerned a bus belonging to the Department of Hospitals of the City of New York which went out of control plunging into the East River in which only four out of eleven passengers survived. The driver was found to have had a myocardial infarct in 1961, and a recurrent angina pectoris since, though with decreasing severity. Autopsy of the driver revealed advanced narrowing of both right and left coronary arteries and a scar of a previous infarct, but no fresh lesion. It must be assumed that the driver had a syncopal attack precipitating the disastrous accident.

Apparently the good record in London as reported by Dr. Norman[2] is due to their practice of taking off driving any bus driver who shows evidence of ischemic heart disease. Out of 17,000 bus drivers only twenty had a coronary attack while actually driving, in half, the driver had time to stop his vehicle and in the other half there were only minor accidents. He states: "My present opinion is that drivers who show definite evidence of having had any coronary disease should be taken off bus driving—An opinion which is shared by the majority of the cardiologists in this country" Using similar criteria, Dr. Walter D. Ludlum, Jr., Medical Director and Chief Surgeon of New York City Transit Authority reports similar high records of safety for in the past ten years only five cases of myocardial infarction occurred during the operation of a vehicle. Four were able to bring their car to a halt while in one, a minor collision occurred with a parked car and no injury resulted.

Following the East River accident the Department of Hospitals of New York City issued instructions on rejection or reassignment from duty as a driver incorporating the experience of both London and Transit Authority of New York as follows. Ischemic heart disease, hypertension of over 180/105, carotid sinus syndrome with syncope, cardiac arrhythemia, such as paroxysmal tachycardia, atrial fibrillation and flutter and heart block, congestive heart failure, intermittent claudication and cerebro-vascular disease are to be considered causes for rejection from driving a bus. When individuals are found with these infirmities on periodic examination or when they return to work after an illness of the type mentioned above, they should be reassigned to non driving duties.

The findings in the heart of the driver mentioned above illustrate clearly that advanced coronary disease is compatible with reasonably good health and adequate functional capacity. But he had had a coronary attack less than two years previously and was more susceptible to further trouble than if he had never had a previous cardiac illness. It is obviously important to screen with care prospective drivers of public motor vehicles with respect to cardiovascular disease and by periodic reexamination, eliminate those who may have developed such a disorder after hire. The incidence of unforseen cardiovascular accidents will be reduced to a minimum, if transit authorities will continually be engaged in intensive case finding by periodic examinations, and when any question arises as to the presence of cardiovascular disease, a consulting cardiologist should be brought in to help evaluate the employers cardiovascular status prior to his final disposition.

What is especially important is that if such rules governing assignment to driving, were to be adopted by all companies engaged in transportation, then the diagnosis given by the physician would speak for itself and the onus of saying yes or no to a patient would be lifted from the doctor's shoulders onto an agreement between management and unions as to what health rules should determine assignment to driving.

L.H.N.

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THE PRESIDENT'S PAGE

3,430 Doctors

THAT is the number of doctors who are members of the Connecticut State Medical Society.

Let's confine ourselves for the moment, to the potential of such a large number of doctors: scientific social, and political. This is a potential not to be ignored if properly exercised. Well over 50 per cent of our doctors are products of the post war era who received their education and training when the scientific explosion was at its height. These are men and women from whom much was expected and who have contributed much. These are the doctors who have made such tremendous strides in new techniques and imaginative research whose benefits we enjoy and whose future benefits still lie over the horizon. These are the doctors who have the greater stake in a free and unfettered medical profession.

Despite this burgeoning of scientific material, the hard-working Editor of CONNECTICUT MEDICINE has to plead constantly for original material of high literary quality and, all too often, his pleas tend to fall on deaf ears. Surely, this is not because the material is not being produced! I venture to say that much of Connecticut's finest material enhances the prestige of many journals throughout the land. If our Connecticut State Medical Society is to grow in luster as it has grown in years, then I suggest one way to help is via our Journal.

The same thing applies to our Clinical Congress. We have the potential of 3,430 doctors who are members of our Society. One would expect that such a large group of highly skilled men and women would contribute to the production of a scientific program of variety and wide appeal (to say nothing of excellence) as a matter of course.

Yet it must be obvious to all of us that something is lacking here because attendance at this yearly postgraduate assembly is disappointing, to put it mildly. That stimulating spark of interest that should be a part of us all seems to imbue only a relative handful of our members. If our Clinical Congress falls by the wayside for lack of attendance and participation and, ultimately, for lack of attractiveness to outstanding medical speakers, it will be a reflection on each physician who belongs to the Society. Our personal pride should demand that we contribute to better programs and take a more active part in our Clinical Congresses in order that there can be no doubts raised as to the quality of medicine in Connecticut.

On the political, social, economic level I point to 3,430 doctors and the great potential influence of such a group of first class citizens. Together with loyal wives we constitute a bloc of opinion of nearly 7,000 citizens. The time to capitalize on such an influence is now. We're not nearly out of the woods just because there is at present a lull in the congressional drive towards socialized medicine. As 7,000 voting citizens we are a power to be reckoned with. We need organization and COMPAC is the nucleus of such an organization. COMPAC showed its mettle so ably in the last session of the legislature that it deserves our support. Without an organization such as COMPAC, our 7,000 votes are likely to be dissipated.

Now is the time to prepare for the inevitable conflict which will be sparked by our welfare-minded Administration at the earliest suitable moment. If you haven't yet joined in "OPERATION HOMETOWN" in your vicinity, I plead with you to do so now.

We have many friends who sympathize with our efforts to remain a free enterprise profession. Without organization we present a vulnerable target. Those who would like to be on our side in the struggle have no center to which to attach themselves, unless we have a strong COMPAC and an enthusiastic "OPERATION HOMETOWN." If our friends are willing to do so much for us we must be willing to do as much for ourselves.

MORRIS P. PITOCK, M.D.

THIRTY-EIGHTH CONNECTICUT CLINICAL CONGRESS

of the

CONNECTICUT STATE MEDICAL SOCIETY

and the

YALE UNIVERSITY SCHOOL OF MEDICINE

Yale-New Haven Medical Center
Mary S. Harkness Memorial Auditorium
333 Cedar Street
New Haven, Connecticut

FRIDAY, SEPTEMBER 27, 1963

GENERAL INFORMATION

Registration:

Registration will begin at 9:00 A.M. The registration fee of $5.00 provides for admission to all sessions of the Congress.

Hospital residents and interns will be admitted without charge, if a statement of their position, signed by an official of the hospital, is presented at the registration desk.

Meeting Place:

All sessions will be held in the Mary S. Harkness Memorial Auditorium in the Sterling Hall of Medicine at the Yale-New Haven Medical Center. The entrance is at 333 Cedar Street. This comfortable auditorium will accommodate an audience of 450.

Telephone:

Telephone messages will be received at New Haven 562-1161, Extension 440.

Luncheon:

Luncheon for visiting physicians will be available in the Memorial Unit Cafeteria.

Parking:

Parking area for visitors is adjacent to the Oak Street Connector between York Street and Park Street, behind the Memorial Unit. There are also pay parking lots on Howard Avenue.

The Yale-New Haven Medical Center is about one-half mile west of the New Haven Green. It is easily reached from the Connecticut Turnpike (via Exit 47) or from Wilbur Cross (via Exit 61) or Merritt Parkway (via Exit 57)

Notes

Special scientific equipment will be displayed in the lobby of the Mary S. Harkness Auditorium.

Address inquiries to
Connecticut State Medical Society
160 St. Ronan Street, New Haven 11, Connecticut

PROGRAM

FRIDAY, SEPTEMBER 27, 1963

MARY S. HARKNESS MEMORIAL AUDITORIUM

9:00 Registration

(Coffee will be served until 9:30)

Morning Session

9:45 Welcome and Opening Remarks:

Morris P. Pitock, Bridgeport, *President, Connecticut State Medical Society*

Richard P. Spencer, *New Haven, presiding*

"A LOOK AT THE CLINICAL USE OF RADIOACTIVE ISOTOPES"

10:00 Lee E. Farr, *Houston, Texas; Professor of Nuclear Medicine, University of Texas Postgraduate School of Medicine; Chief of Nuclear Medicine, University of Texas M.D. Anderson Hospital and Tumor Institute*

10:30 Sergei Feitelberg, *New York City; Director, Physics Department, Mount Sinai Hospital; Associate Clinical Professor of Radiology* (*Physics*), *Columbia University College of Physicians and Surgeons.*

11:00 Questions and Discussion

11:45 Intermission

Paul B. Beeson, *New Haven, presiding*

12:00 Clinical Pathological Conference

Ivan L. Bennett, Jr., *Baltimore, Maryland; Baxley Professor and Director of Department of Pathology, Johns Hopkins University; Pathologist-in-Chief, Johns Hopkins Hospital*

Discussant: Franklin H. Epstein, *New Haven; Associate Professor of Medicine, Yale University School of Medicine; Attending Physician, Grace-New Haven Community Hospital*

1:00 Luncheon

Afternoon Session

David Seligson, *New Haven, presiding*

"ISOTOPES AS AN AID TO THE CLINICIAN"

2:30 Blood and Blood Volume

Louis Robert Wasserman, *New York City; Director, Department of Hematology, Mount Sinai Hospital; Associate Clinical Professor of Medicine, Columbia University College of Physicians and Surgeons*

3:00 Kidney and Kidney Function

Richard P. Spencer, *New Haven; Associate Professor, Nuclear Medicine (Radiology) Yale University School of Medicine; Director, Radioisotope Laboratory, Yale-New Haven Medical Center*

3:30 Liver and Gastrointestinal Tract

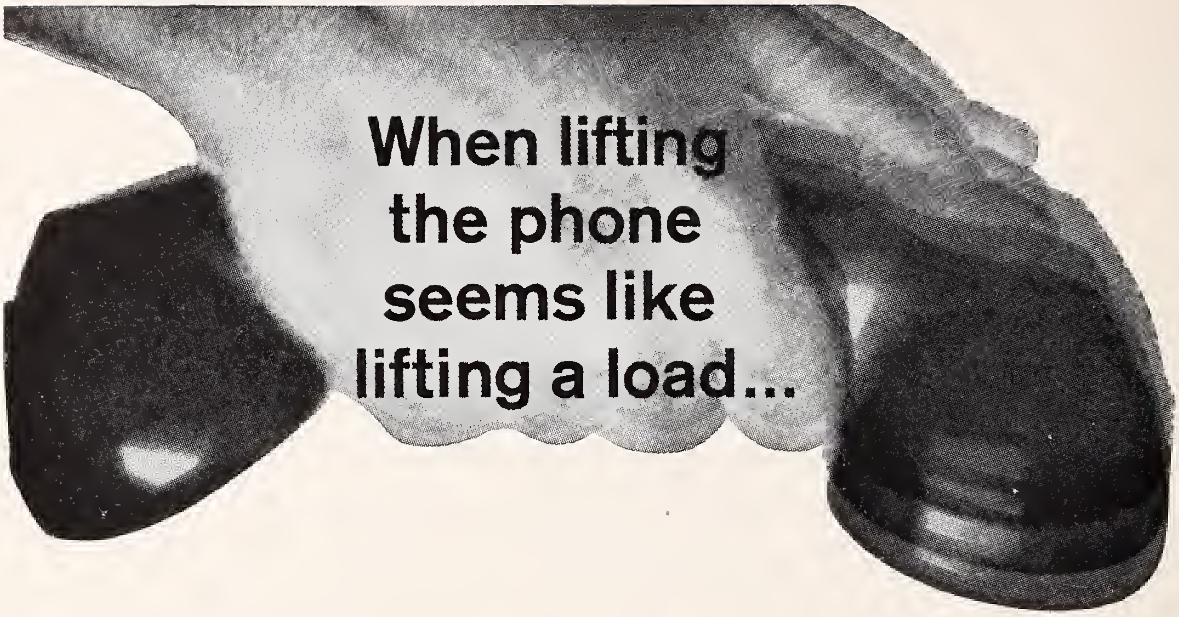
Merrill A. Bender, *Buffalo, New York; Chief, Department of Nuclear Medicine, Roswell Park Memorial Institute; Assistant Professor of Radiology, School of Medicine, State University of New York at Buffalo*

4:00 Thyroid and Thyroid Function

Solomon Silver, *New York City; Associate Clinical Professor of Medicine, Columbia University College of Physicians and Surgeons; Attending Physician and Chief, Thyroid Clinic, Mount Sinai Hospital*

4:30 Questions and Discussion

5:00 Adjournment



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Caution: Epinephrine should not be administered with ISUPREL (isoproterenol/Winthrop) as both drugs are direct cardiac stimulants and their combined effects may induce serious arrhythmia. If desired they may, however, be alternated, provided an interval of at least four hours has elapsed.

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Winthrop

Fracture-Dislocation Of The Zygoma And Zygomatic Arch

By Howard W. Smith, M.D.

■ The zygomatic bone, often referred to as the malar or "cheek" bone is classified anatomically as one of the facial bones. It occupies a prominent and conspicuous position in the makeup of the human facial skeleton and in this position is subject to trauma from many directions. Traumatic force directed toward the orbit or cranial cavity is frequently absorbed by the zygomatic bone. This bone usually absorbs force at the expense of fractures in the weaker adjacent bones. The body of the zygoma is seldom fractured as a single injury and rarely is it dislocated by means of simple disarticulation. The common finding is a dislocation of the zygoma with compression fractures of the thin maxillary bone at the lateral apex of the maxillary sinus. The direction and distance which the zygomatic bone travels in the process of dislocation determines the magnitude of the cosmetic defect and the severity of the physiologic disturbance.

The subject of zygomatic fracture-dislocations is deserving of critical re-evaluation not so much for the fracture dislocation itself but for the associated injuries which occur to the adjacent structures and are too frequently unobserved. Associated injuries to the maxillary sinus, orbital floor, infraorbital nerve, orbital contents, and masticatory apparatus resulting from a fracture dislocation of the zygomatic bone, all deserve evaluation and many require specific treatment. It is time for all disciplines treating injuries of the facial skeleton to practice more than a simple trick maneuver to replace the dislocated body of the zygoma. It is time for the repair of these injuries to become an integral part of the overall treatment of multiple facial skeletal fractures for the restitution of both function and appearance. All too frequently the various physiologic defects, so carefully considered in establishing the diagnosis, are completely forgotten once the facial contour defect has been corrected.

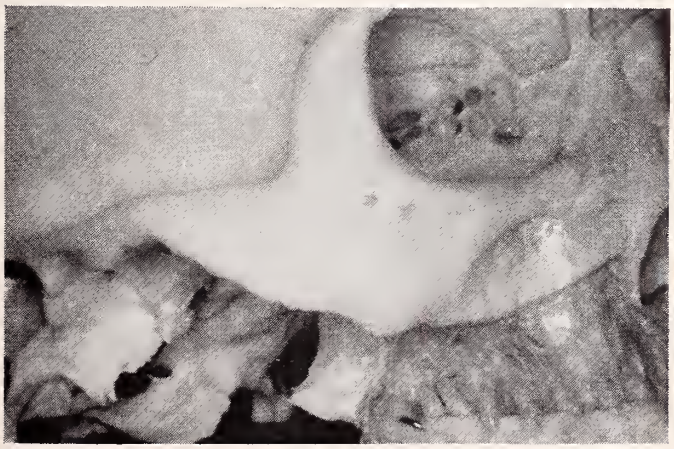

Figure I
Prepared skill showing zygomatic bone.

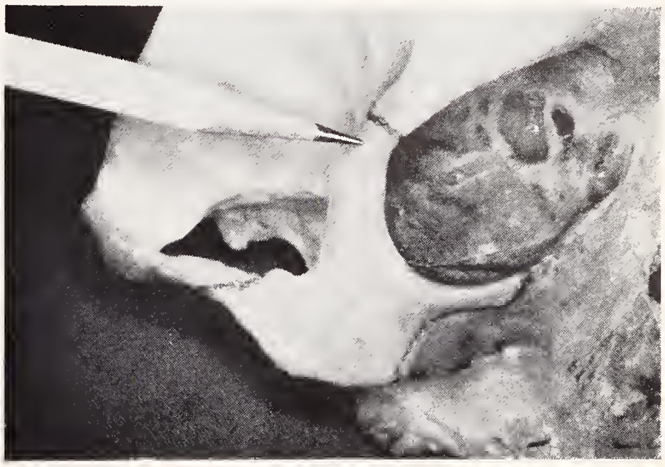

Figure II
Fronto-sphenoidal process of zygoma.

Anatomy

The zygomatic bone is a solid structure composed mostly of compact bone and described as having a body and four articular processes. The body forms the lateral and inferior border of the orbit and through its processes articulates with frontal, maxillary, temporal and sphenoid bones. This composite structure (Fig. 1) occupies a prominent position and acts as an arch abutment for the lateral facial skeleton. The fronto-sphenoidal process (Fig. 2) articulates anteriorly with the frontal bone (Fig. 3) along the superior lateral orbital rim and posteriorly with the greater wing of the sphenoid bone along the lateral wall of the orbital cavity. The orbital process (Fig. 4) is a thick strong plate which projects backward and medially from the lateral

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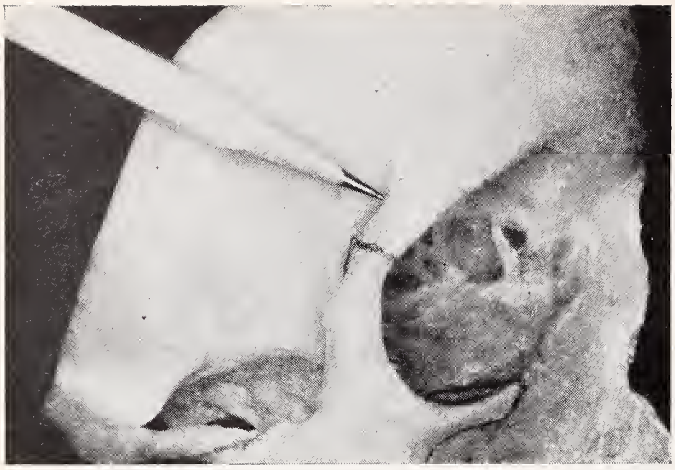

FIGURE III
Zygomatic process of frontal bone.

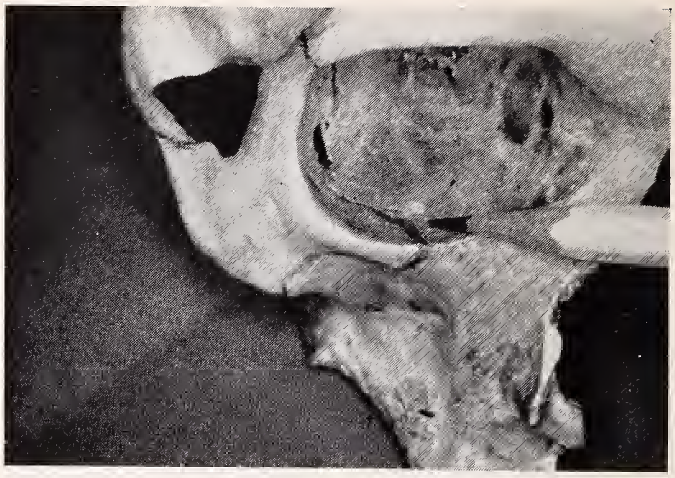

FIGURE IV
Maxillary process of zygoma.

inferior obital margin. It provides only a very small portion of the total orbital floor. The maxillary process (Fig. 5) is very short and presents as a rough triangular area on the inferior antero-medial aspect of the body of the zygoma. The temporal process (Fig. 6) is a short slender arch of bone projecting backward and slightly lateral to meet the long slender zygomatic process of the temporal bone. Its length and strength varies according to the location of the arch suture.

The zygomatic periosteum is densely adherent to the bone and is continuous with the periosteum overlying the outer surface of the skull. As the periosteum passes over the orbital margin it continues on as the periosteal lining of the orbital cavity. That portion covering the orbital surface of the zygoma, like the remainder of the periosteum lining the orbit, is quite loosely attached except at the suture lines and at the orbital tubercle. At this tubercle, the aponeurosis of the levator muscle, the lateral palpebral ligament, and the lateral check ligaments from the rectus muscle are all fused into a single strong fascial attachment.[1] The periosteum lining the orbital floor area is thinner than that covering the medial, lateral and superior walls of the orbital cavity.

The lower border of the strong temporal fascia, as it approaches the zygomatic arch, divides into two sheets. The inner sheet of fascia attaches to the medial border of the arch and outer sheet of fascia attaches to the lateral border of the arch. The inner sheet ends at the zygomatic arch, but the outer sheet of fascia continues on as part of the masseter muscle fascia.

Three muscles attach directly to the zygoma. The largest is the masseter, a muscle of mastication; the other two are muscles of facial expression, the zygomaticus, and the zygomatic head of the quadratus labii superioris. The zygomatic portion of the quadratus arises from the lateral surface of the body of the zygoma near the zygomatic-maxillary suture. The zygomaticus arises from the lateral portion of the body and the temporal process near the zygomatic-temporal suture. Both portions of the masseter muscle arise in part from the zygoma. The larger superficial portion arises by tendinous

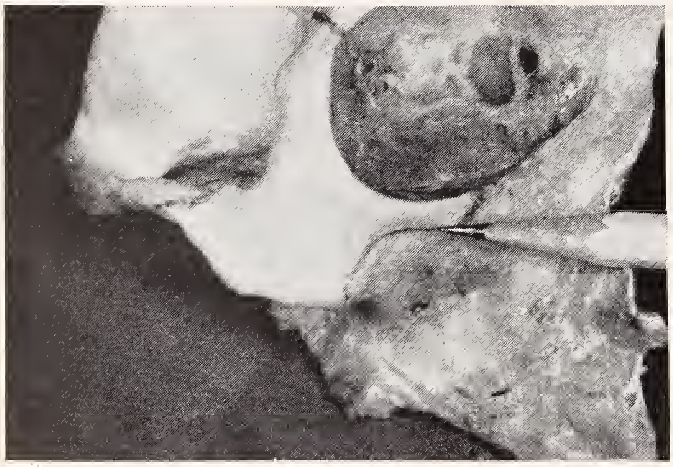

FIGURE V
Orbital process of zygoma.

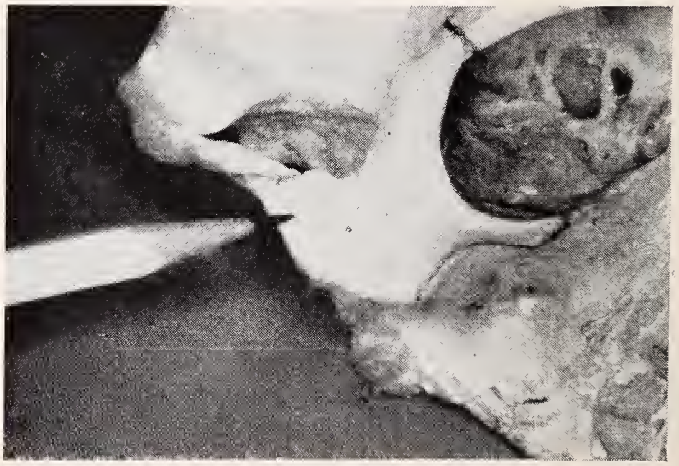

FIGURE VI
Temporal process of zygoma.

aponeurosis from the maxillary process and from the anterior two-thirds of the lower border of the arch. The smaller deep portion arises from the posterior one-third of the lower border of the arch and from the entire medical surface of the zygomatic arch.[2]

Physiology

The zygomatic bone offers more useful protection to the eye than any other bone. This protection is afforded mostly in the postero-lateral position which is out of the visual field. The bone offers support not only for the periosteal lining of the orbital cavity but provides attachment for ligaments and muscles directly involved with support and movement of the eye globe. The act of chewing is also aided by the firm support which this bone offers to the maxilla by virtue of its abutment position. The peculiar shape of the zygomatic bone provides a masticatory muscle tunnel beneath the temporal process and an outside attachment for the muscles of facial expression and mastication. Although three muscles are attached to the zygoma, they are not of significance in maintaining a dislocated position following fracture but do play a strong role in causing dislocation at the time of injury. The masseter muscle tension at the time of trauma is a prime factor in causing dislocation when the traumatic force is in the same direction as the contraction force of the muscle.

The Injury

The direction and magnitude of the traumatic force greatly affects the nature and the degree of the resulting injury. The age of the patient; position of the head; mobility of the head; mobility, speed, size, shape and weight of the traumatic object are other factors influencing the final injury. A single factor of great importance is the position of the mandible at the time of injury. As most blows come within the visual field and are exepcted, the mouth is open and the masseter muscle tense. This facial posture is achieved by attempting to or actually screaming. The prominent position of the zygoma makes it especially vulnerable to direct force approaching obliquely from the side and anteriorly.

Lateral Trauma

Direct lateral force over the temporal process tends to collapse the arch creating one or more fractures in the arch and a separation of the zygomatic-temporal suture. The separated suture often lies at the apex of the depression. The arch fracture site varies with the nature of the striking object and the length of the temporal process. Small objects tend to cause a V-shaped depression of the arch at the point of contact. With a short temporal process it is possible to have the fracture entirely within the temporal bone portion of the arch with only minor fragmentation of the zygomatic side of the serrated bony suture line. Direct lateral force on the body of the zygoma causes medial dislocation of the zygoma causing hinge action at the zygomatic-frontal suture with impaction of the maxillary process into the sinus and rotational separation at the arch. A "step" may not be felt along the inferior orbital rim but an acute angle of impaction in the mouth below the body of the zygoma is readily palpable along the zygomatic process of the maxilla. The most striking part of the injury is the facial asymmetry. Stellate fractures rarely occur in the body of the zygoma with direct lateral force.

Lateral blows from behind forward have the same resulting injury as direct lateral blows but tend to create a more anterior dissipation of the force with impaction of the body of the zygoma into the maxillary sinus. There may be actual separation of the fragments at the zygomatic temporal suture. The zygomatic frontal suture again hinges without separation. With the zygomatic maxillary suture line impaction, the infraorbital nerve is often crushed. The body of the zygoma tends to rotate downward and inward into the maxillary sinus.

Lateral blows from above downward produce downward displacement of the zygoma into the maxillary sinus and mouth with separation of the fronto-zygomatic suture rather than hinge action at this point. There is usually complete separation of the sutures, and "steps" can be felt externally at all three prominent superficial suture lines. The maxillary portion of the orbital floor is not usually involved but facial asymmetry and a lowered eye globe are readily observed. The angular process of the frontal bone may also be fractured.

Lateral blows from below upward tend to push the zygomatic body into the orbit cavity and infratemporal fossa. There is separation of the zygomatic-temporal suture. The anterior border of the greater wing of the sphenoid is impacted. Fracture of the zygomatic process of the frontal bone rarely occurs. There is little tendency of eye injury from this direction as the force is directed toward the temporal fossa parallel to the orbital cavity and masseter muscle contraction tends to counteract the blow. As the zygomatic temporal suture separates the weakest point along the arch often fractures, usually in the mid-portion. A "step" in the infraorbital rim is not always noted along the superior margin but usually can be felt along the anterior margin of the inferior orbital rim. The thin bone on the floor of the orbit is telescoped as the body of the zygoma is displaced posteriorly and medially.

Lateral blows from an anterior position are most frequent and usually cause the greatest damage. There is direct dissipation of the force down and in at the zygomatic maxillary suture with hinging at the zygomatic frontal suture. The arch may fracture or separate at the suture line by this buckling force. The orbital contents are compressed by the zygomatic bone invading the orbital cavity. If the mass providing the force of injury is large enough to prevent the eye globe from moving forward, the thin posterior one-half of the orbital floor is forced downward. The zygomatic orbital rim dislocated posteriorly may force the orbital portion of the greater wing of the sphenoid into the superior orbital fissure causing a superior orbital fissue syndrome.

Anterior Trauma

Direct anterior force striking the zygomatic bone tends to force it backward buckling the arch outward by rotation with a hinging action at the zygomatic frontal suture. This crushes the antero-lateral floor of the orbit and produces a direct separation of the zygomatic-maxillary suture. The "step" is best felt on the anterior surface of the infraorbital rim. The effect on the orbital contents varies with the size of the traumatic agent. Large objects prevent free forward herniation of the soft tissues when the orbital cavity is invaded by the body of the zygoma.

Anterior blows from a lateral position are the same as lateral blows directed from an anterior position and the injuries resulting are identical.

Anterior force from a medial position is rarely an isolated blow as the nose absorbs most of the force. The effect on the zygoma is one of outward displacement of the body with separation at the zygomatic-maxillary suture and hinging at the zygomatic-frontal suture. This is almost a true dislocation with the arch bowed outward. Separation may occur at the zygomatic frontal suture as well as the zygomatic maxillary. "Steps" are palpable at each of these suture separations.

Anterior force from above downward causes separation of the zygomatic frontal suture and a lowering of the whole compound into the maxillary sinus and oral cavity. There is usually fracture of the arch and a separation at the zygomatic-temporal suture. The temporal fossa periosteum stretches and may tear near the arch fractures. This fracture dislocation after reduction does not stay in position because of the over-stretched or torn temporal fascia and the lack of articulation due to the crushing defect in the zygomatic process of the maxilla. The tip of the zygomatic process of the frontal bone may fracture if the traumatic force hits near the process.

Anterior force from below upward is not common. The direct force is usually absorbed by the mandible and maxilla first. This force may cause a simple fracture of the infraorbital rim. The arch and zygomatic frontal sutures usually hold and the body of the zygoma may fragment instead of becoming displaced. Dislocation of the body, when it does occur, is inward at the zygomatic process of the maxilla. The "step" in the inferior orbital rim is felt along its anterior and superior surfaces.

Associated Local Effects Of Trauma

1. Compression of the temporal muscle with laceration or hematoma.
2. Compression of the coronoid process of the mandible with or without fracture.
3. Decrease in size or antral cavity.
4. Brief ipsilateral nasal hemorrhage of antral origin.
5. Change in size of the orbital cavity.
6. Hemorrhage into the orbital cavity and into the extraocular muscles with ecchymosis, edema, and possible loss of vision.
7. Displacement of the eye globe with visual disturbance.
8. Herniation of orbital contents through the posterior half of the orbital floor into the maxillary sinus.
9. Infraorbital nerve compression or laceration with numbness of the cheek, lip, and anterior maxillary teeth.
10. Compression fracture of the greater wing of the sphenoid causing a superior orbital fissue syndrome.
11. Other associated injuries as indicated by Coakley and White[3] occur in the following incidence:
    a. Concussion 26 per cent
    b. Facial laceration 22 per cent
    c. Mandibular fracture 14 per cent
    d. Maxillary fracture 11 per cent
    e. Nasal fracture 9 per cent

Diagnostic Considerations

Each fracture dislocation of the zygoma is an individual problem with respect to diagnosis and treatment. The associated injuries must be anticipated and searched for. An occasional case may be misdiagnosed when the patient is examined in the presence of massive edema, the X-rays are of poor quality or of a limited selection, and the patient is unable to provide the necessary history and subjective symptoms. A fracture dislocation of the zygoma with peripheral bone fractures may on occasion be easily diagnosed by observation alone in the first two or three hours following injury; however, the exact nature of the peripheral bone and soft tissue injuries requires further investigation. Edema appears rapidly and obscures the flatness observed in the upper one-half of the cheek. An exaggerated but natural fullness of the lower one-half of the face and cheek may keep the skin taut over the fracture site preventing its depression with the bone. Epistaxis limited to the site of injury may be quite brief and observed only in the first few hours. Eye globe position and pupil level disturbances may be observed early but are not seen later as the depressed eye globe is temporarily restored to a normal level by orbital tissue edema. This eye defect reappears as the swelling decreases during the following three-five days. Bulbar ecchymosis extending beyond the conjectiva laterally may signify disruption of the bony orbit. Extraocular movements of globe decreased with onset of edema but may represent injury to the oculomotor nerve.

Palpation of the complete orbital margin and zygomatic arch will reveal points of separation or impaction. Continued firm pressure over a fracture site or suture separation will often squeeze out the overlying edema making evaluation by palpation worthwhile. Anesthesia of the upper lip should be recorded as well as the presence of subcutaneous emphysema. Oral examination will demonstrate ecchymosis in the buccal sulcus mucosa anesthesia of the upper teeth; separation or angulation of the shallow concavity at the root of the zygomatic process of the maxilla as compared with the opposite side; limited opening of the mouth, and deviation of the jaw to the side of injury or opening. Patients frequently do not complain of diplopia immediately after an injury because they are preoccupied with other circumstances of the traumatic episode. Early examination, however, will often record diplopia before edema reduces the visual field to obscure this important clinical sign. Mobility of the bone and crepitation are uncommon because impaction and muscle spasm keep the fragments in a stable position. Pain produced on opening the mouth should be localized. Lateral excursion of the jaw with the mouth open should be attempted and the degree and direction of restriction noted.

When X-rays are readily available the following views are desirable: Cauldwell, Waters, and submentovertex. Occasionally it is necessary to obtain views of the optic foramina. If only a single view is taken, the conventional unconed Waters view is perhaps the most helpful single exposure but one must be aware that the zygomatic bone is most frequently displaced along the line of the central ray thus minimizing the degree of dislocation. The zygomatic process of the maxilla is an excellent area to observe for it can be readily compared with the normal side. The orbital floor should be compared in both the Waters and Cauldwell views. The zygomatic arch is best seen in the submental view. Inferior displacement of the bony orbital floor is often difficult to demonstrate by X-ray because of the thinness of the bones themselves; the associated edema of the face; and the probability of edema or hematoma in the sinus lining, or fluid in the maxillary sinus.

Diagnostic considerations have been outlined with reference to pinpointing the zygomatic fracture-dislocations with associated peripheral bone and soft tissue injuries. The patient is first and foremost to be considered a case of head trauma warranting continuing vigilance for signs and symptoms of intracranial injury.

Treatment

The surgical treatment of fracture dislocations of the zygoma and zygomatic arch has an interesting background. The earliest reported description of the injury was accompanied by suggested methods of treatment. More than 200 years have passed since Duverney[4] described the injury and during that time at least twenty-three methods and twenty-four instruments have been introduced. (Fig. I).

By 1900 all the presently known methods of reduction had been introduced except for minor variations in the surgical approach. This was not true of the methods of immobilization, for that phase of treatment has continued to produce at least one new method each year during the past ten years. This injury itself has changed over the years. Early literature described the injury, in most instances, as of a simple type with minimal displacement and the resulting disability was due mostly to associated edema. The injuries occurred more often in men where the cosmetic defect was of little concern. Current methods of treatment are based chiefly on an increased severity of the injury and concern for an acceptable cosmetic result.

The treatment of this injury over the years has attracted the attention of the neurosurgeons, ophthamologists, otolaryngologists, oral surgeons, plastic surgeons, orthopedic surgeons, and general surgeons, in addition to the general medical practitioner who sees and treats a number of these injuries yearly.

The surgical treatment of fracture dislocations of the zygoma and zygomatic arch at the present time should reflect the importance of this injury as a relative part of the whole facial skeleton. The majority of present day zygomatic injuries are but a small component of the total facial skeletal injury. Its importance in the overall treatment, however, is not a small one for the facial skeleton has in most instances to be re-assembled either from the skull downward or from the mandible upward. For this assemblage a foundation is necessary and the zygoma is the key to the middle third of the face. The zygoma is the lateral foundation for re-assembling the maxilla onto the skull. The dental structures are assembled one against the other and the intermaxillary compound is fastened via the zygoma to the frontal bone.

Satisfactory treatment is aimed towards restoring the following:

1. Symmetry to the face.
2. Free and sufficient opening of the mouth.
3. Natural protection for the eye globe.
4. Relieving pressure on compressed sensory and motor nerves.
5. Re-aligning the eye globe with correction of visual field defects.
6. Integrity of the maxillary sinus.
7. Buttress strength provided to the maxilla by the zygoma in molar mastication.
8. Soft tissue continuity with minimal scarring.

Treatment may be considered as immediate, delayed, or later. Each time period has its advantages and disadvantages, but in general these considerations are mostly academic since the condition of the patient and the presence of more serious injuries are of prime importance and usually influence the time of treatment. Immediate treatment can often be performed and has local advantages such as minimal edema, greater ease of bone reduction, best chance for natural immobilization by interlocking articulation, ready access to the soft tissue wound for proper closure, good exposure through existing lacerations, and good primary plastic closure. One accepts the disadvantages of a less complete workup of patient, often poor hour, incomplete or inadequate X-rays, increase in anesthetic risk with free blood in upper respiratory tract, untrained assistants, untrained anesthetists, and minimal consultation.

Delayed treatment corrects many of the above disadvantages, but important local advantages are often lost. Procedures effective in early treatment may not be as effective in delayed treatment. In general, more emphasis must be put on re-fracture and immobilization techniques.

In late treatment, emphasis is either in disarticulation and re-positioning of bone or camouflage techniques using bone, plastics, cartilage, or dermal implants.

Discussion

Fracture dislocations of the zygoma are worthy of increased consideration. This is especially true with its important role in the overall treatment of middle third of the face fractures. Although multiple fracture combinations have increased in complexity and frequency with present day modes of travel, the more or less isolated fracture dislocation of the zygoma with associated adjacent bone injuries is still with us. This latter type of injury usually does not receive sufficient diagnostic and therapeutic consideration. Many times the patient does not consider his injury worthy of treatment for he is soon relieved of pain by subsequent edema. He is initially unaware of his physiologic defects, because edema often closes one eye and limits jaw movements. He, however, remains confident that all will be well when the edema subsides. Occasionally this confidence is shared by examiners when treatment is sought during the edematous stage of the injury. As the swelling gradually subsides over the following 5-8 days, the physiologic defects become increasingly apparent.

Anatomic factors influence to some degree the type and severity of the injury resulting from a blow to the zygoma. The temporal process of the zygoma varies in length by approximately 2 cm, thus changing the location of the suture line. When the zygomatic temporal articulation is near the zygomatic bone, the zygomatic process is short and thick. This allows for greater ease of rotational dislocation and in addition there is a shorter expanse of restraining temporal fascia. In most arch injuries, the articulation area participates in the V-shaped depression. The longer the zygomatic portion of the arch, the greater the likelihood of the articulation forming the vertex of the angular depression. The temporal fascia, when well-developed, aids greatly in preventing dislocation and often maintains a fracture in proper alignment after reduction. This fascia usually stabilizes small arch fragments and fortunately makes direct open reduction and fixation of these pieces an infrequent procedure. The mouth is frequently open at the time of trauma causing the masseter muscle to exert counter traction. Blows on the zygoma, masseter muscle, and jaw are reinforced by the masseter contracting force causing a downward shift of the zygomatic arch with disarticulation at the suture lines.

The direction from which the traumatic force comes is of interest. This information cannot be obtained from the history in many instances but the facial contusion and lacerations act as guides. Knowledge of the probable effect on the peripheral bones will aid in searching for the physiologic defects. The site of trauma should influence the surgical approach for repair of the skeletal defects. In general, it is unwise to use the temporal approach to reduce arch fracture dislocations if there has been considerable trauma to the temporal fossa. Incisions in a traumatized temporal fossa may cause inadvertent opening of the thick temporal muscle sheath producing herniation of an edematous muscle. This results in prolonged tenderness and trismus. Far more serious is the likelihood of creating further hemorrhage into the orbit without a dependent drainage route. This latter complication has been minimized in the literature but a few cases reported[36, 37, 38] are worthy of review by staunch advocates of the Stromeyer approach (1844)[6] as revised to the hairline by Gilles 1927.[19] The temporal approach also provides the opportunity to use the thin temporal fossa as a fulcrum foundation in levering the zygoma back into position. A depressed skull fracture can easily result.

X-rays should not be used as a substitute for clinical examination. Dislocations readily palpable as "steps" at suture lines may not be as evident in the X-ray. In general, X-rays tend to minimize the degree of dislocation.

Recent interest in correcting the late effects of trauma to the orbit with depression of the floor of the orbit posteriorly should not make every fracture dislocation of the zygoma a blowout fracture of the orbital floor. There is a lowering of the eye globe with diplopia in most fracture dislocations of the zygoma. Several factors can lead to misinterpretation of a blowout fracture combined with a fracture dislocation of the zygoma. The thin bones of the anterior floor of the orbit around the infraorbital nerve are easily fractured and displaced downward when the zygomatic maxillary suture is impacted and the maxillary portion crushed and telescoped. Along with this there may be edema of the mucosa in the roof of the sinus. Hematomas readily develop in this mucosa as well as free accumulations of blood under the mucoperiosteum. The most significant factor in the blowout injury is the ruptured orbital periosteum. This defect allows for lateral diversion of its edges with downward traction on the inferior orbital muscles due to related periosteal fibers. In addition, edema and hemorrhage aid in forcing these muscles and fat alike into the upper portion of the maxillary sinus. Edema holds these structures in an abnormal position causing the early signs, and fibrosis fixes them there producing the late signs. It is hard to conceive of the thin flakes of bone from the posterior orbital floor floating about in this edematous mass as ever creating a "trap door" pincer problem with the inferior rectus muscle.

Conclusions

The subject of fracture dislocation of the zygoma has been presented to stress the importance of associated injuries occurring in the adjacent bones. These injuries occur frequently and should be searched for in every case. Fracture dislocations are not primary cosmetic defects in most instances; they are traumatic injuries with either immediate or delayed physiologic deficits. In each patient these injuries have to be evaluated and in many instances require treatment when the facial contour defect is reduced. To correct the contour defect and have the associated injuries become apparent weeks or months later is a huge disappointment to both patient and surgeon alike. Full knowledge of the probability and extent of such injuries will serve as a useful guide in the treatment of these cases.

The composite treatment method, currently popular, was introduced in isolated steps in the late 18th and early 19th century. Some refinement in technique has occurred since, along with improved general anesthesia. Recent contributions to methods of treatment have been mostly related to immobilization and delayed correction of physiologic defects.

The list of specialties interested in this injury is long and varied. This has come about in most instances by circumstances. The general medical practitioner in many communities is the only one immediately available. The same is true for the general surgeon and the general dentist. In communities with a medical center, these injuries are first seen in the emergency facility and specialists are called in consultation. Most often the patient is admitted on a neurosurgical service for observation and consultation from ophthamology, otolaryngology, dental surgery, and plastic surgery are obtained for the delayed procedure.

Simple closure of the facial wound in the emergency facility before the facial skeleton is evaluated is deplorable. The use of multiple consultants in the preoperative period is most helpful for the delayed case. The team approach (using multiple specialists in the surgical team) is however, not helpful in this field of surgery. It is strongly recommended that the middle-third of the face injuries, which include the zygoma, be treated by individuals familiar with the anatomy and physiology of the upper respiratory tract, orbit, nose, paranasal sinuses, and maxilla. It is further recommended that those disciplines currently treating these injuries broaden their basic knowledge to include techniques of the other interested specialties. This is especially recommended for the treatment of those cases where serious complicating factors do not preclude immediate treatment. In this way a better result can be obtained for the majority of these injuries at an optimum time and with a minimum of confusion and cost to the patient.

Chart I

Year	Author	Method of reduction and immobilization
1751	Duverney[4]	Thumb pressure on arch.
1751	Duverney[4]	Finger pressure in mouth.
1751	Duverney[4]	Patient bites on wood block.
1825	Ferrier[5]	Open reduction and low temporal direct elevation with spatula.
1844	Stromeyer[6]	Hook under arch through skin.
1847	Dupuytren[7]	Elevation via existing skin wounds.
1878	Agnew[8]	Elevation with screw tip via skin.
1895	Dennis[9]	Open reduction and direct wiring.
1895	Dennis[9]	Open reduction and temporary wire traction.
1895	Stimson (as reported by Dennis)[9]	Spontaneous reduction by yawning.
1896	DeCapraris[10]	Elevation with Davis rectal spoon in mouth—no incision.
1896	Matas[11]	Subcutaneous silver wire and traction.
1896	Treves[12]	Canine fossa incision.
1901	Cheyne et al[13]	Anterior masseter, oral incision.
1906	Lothrop[14]	Canine fossa incision with elevation and packing.
1910	Codman[15]	Bullet forceps via skin.
1913	Manwaring[16]	Cowhorn dental forceps via skin.
1924	Goldthwaite[17]	Buccal sulcus incision and elevation.
1927	Gilles, et al[18]	High temporal fossa incision and elevation.
1927	Kazanjian[19]	Wire traction to head cap.
1928	Gill[20]	Modified towel clip via skin.
1928	Gill[20]	Padded wood and mallet.
1928	Roberts[21]	Corkscrew.
1931	Shea[22]	Ritter sound via nose.
1931	Ivy et al[23]	Screw and screw porte.
1935	Patterson[24]	Collins sliplock and Straude-More straight tenaculum.
1935	Patterson[24]	Ice pick with tenaculum.
1935	New[25]	Hook and traction.
1938	Ackerman[26]	Conical thread screw.
1941	Baxter[27]	Dental splint.
1942	Adams[28]	Stainless steel wire.
1951	Brown et al[29]	Kirschner wire.
1952	Anthony[30]	Antral balloon (retention)
1952	Anthony[30]	Antral forceps.
1952	Anthony[30]	Antral jackscrew.
1952	Crowe[31]	Zygoma hook.
1954	Suraci et al[32]	Intraoral hook.
1956	Jackson et al[33]	Antral balloon (reduction)
1957	Boudreaux[34]	Urethral sound via buccal sulcus.
1958	Flynn et al[35]	Skeletal head frame.

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A few days ago, I was permitted to inspect the body of a person who died of the disorder which you have described in No vi. Vol. 11. of the Medical Transactions, and named the *angina pectoris.* As this is the only opportunity I have ever had of enquiring into the cause of that complaint; and as you yourself acknowledge that you never saw any one opened, who died of this disease, I hope the following account, imperfect as it is will not be entirely unacceptable to you or the College . . . the pain under the sternum constantly extended itself on each side across the breast in the direction of the pectoral muscle, and affected one, or commonly both arms, exactly in the place where the muscle is inserted into the os humeri.

Upon examining the heart, no part appeared diseased, till we opened the left ventricle; and there, the semilunar valves, placed at the origin of the aorta, were found to be perfectly ossified.

From the instant this rigidity in the valves first began, the circulation through the heart, and consequently through the lungs, was in some degree impeded. . . .

—William Heberden

Silicone In The Relief Of Gaseousness: A Double Blind Study

By Milton M. Lieberthal, M.D. and H. David Frank, M.D.

Introduction

■ One of the common causes of symptoms referable to the gastrointestinal tract is that of gaseousness, often complained of as bloating, fullness, rumbling, flatulence, belching, flatus, severe pressure, and even pain. Sometimes these complaints from gaseousness are associated with a large, readily detectable gaseous inflation of some or all of the gastrointestinal tract.[1] At other times, in the presence of identical complaints, the volume of gas is so small, no definite accumulation of it can be identified. Sometimes a large, readily detectable collection of gas is associated with absolutely no symptoms at all. It is therefore probably true that some additional factor beside the mere presence of gas in large or small amounts is necessary to cause the *complaints* of gaseousness. And it is possibly true that this additional factor consists of a relative increase in the state of contraction of nearby gastrointestinal tract smooth musculature. Thus, it may very well be that the net tension-pressure relationship between the gas and its gastroenterologic container actually determines the presence or absence of symptoms rather than just the collection of gas itself. This assumes that the patient possesses a reasonably normal degree of consciousness and bodily vigor.

There are three recognized means by which gas may reach the gastrointestinal tract: by ingestion, as in air swallowing;[2] by diffusion from the blood stream, most commonly of carbon dioxide;[3] and by chemical change of gastrointestinal contents, or putrefaction.[4] The first of these is considered to be the source of at least 70 per cent of the gas found in the gastrointestinal tract, even in cases of intestinal obstruction.

And there are at least two forms in which gas can exist in the gastrointestinal tract: In large volumes confined only by the available lumen itself;[5] and in the form of small or "froth" bubbles caused by changes in surface tension and by entrapment of gas by thick mucus.[6]

Finally, there are three ordinary means by which gas may leave the gastrointestinal tract, aside from the artificial methods of removing it; by ejection through mouth or anus; by diffusion into the blood stream;[3] and by absorption through the intestinal wall.

Thus, though it may be said that the actual *accumulation* of gas anywhere in the gastrointestinal tract represents the disparity at any given time between the gas-forming and gas-removing mechanisms, the *complaints* of gaseousness probably result from the modification of this accumulation by the abnormal pressure-tension relationships between the inflating gas and its smooth muscle container.

To relieve the complaints of gaseousness, then, it should be necessary to (1) diminsh the pressure of the gas by decreasing its amount, and (2) to lessen the tension confining it by restoring gastrointestinal tract motility, and lessening abnormal spasm.

These observations suggest a many-pronged therapeutic attack on the complaints of gaseouness. And, in fact, considerable experience has now been gained in the use of appropriate diets, antispasmodics, psycho-therapeutic modalities, bowel regulators, intubation-suction mechanisms, and surgical procedures. However, only comparatively recently has it been realized that none of these means necessarily modifies the presence of the "froth" or small gas bubbles in the gastrointestinal tract; that, furthermore, such bubbles not only exist[8, 9] but often may be the major source of gaseousness and the complaints stemming therefrom; and that, finally, it is possible[6] and important to destroy these bubbles and gassy froth, and thus further relieve the patient of his complaints.

Purpose

In 1954, Hirschowitz, Bolt, and Pollard[10] and others[6, 11] called attention to the defoaming action of silicone and its application in ridding the gastroscopically-viewed stomach of froth and bubbles. In 1960, Rider[9] and Moeller[12] reported their favorable experiences with the defoaming property of the silicone, methyl polysiloxane. In 1961, Pellegrine and Silberner[13] reported an even more satisfactory experience with the silicone, dimethyl polysiloxane,

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this time combined with the enzymes, pepsin, pancreatin, and diastase.

Because of our own interest in this subject, first aroused during the preparation of our 1955 report of gaseous inflation of the entire gastrointestinal tract,[1] we decided to investigate further the clinical value of the defoaming property of this silicone-enzyme combination, and to do so by means of a double blind study of patients taken at random from our private practice. The purpose of this paper is to describe that study, and to report the results obtained.

Method And Materials

The silicone used was dimethyl polysiloxane, a highly refined and inert form of pharmaceutical grade. Ordinarily, this preparation is very hydrophobic, but the dimethyl polysiloxane in this study had been provided with a catalytic release agent in such a way as to create, in effect, hydrophilic properties. This was prepared in a dual phase tablet. In the outer layer, 20 mgms. of dimethyl polysiloxane were placed, along with 100 mgms. of pepsin, N.F. and 25 mgms. of diastase, for immediate release in the stomach. The inner core, enteric coated, contained 240 mgms. of pancreatin, N.F., as well as 40 mgms. of dimethyl polysiloxane, for release in the intestine.*

The placebo tablets** used were identical in appearance and taste to those containing the active substances described above, and neither author, nor the patients, nor the office assistants could tell which preparation, active or placebo, was being given. Indeed, no patient even knew there was a placebo. The containers of the active substance and of the placebo were marked only to facilitate record-keeping. Their final identification was not made until the entire study had been completed.

The inclusion in the tablet of the pepsin, diastase, and pancreatin was precipitated by recognition of the fact that changes in the alimentary tract secretions and those of its ancillary structures have significant bearing on the problems of nutrition and excess gas-formation in later years, as pointed out by Stieglitz[14] and Snell.[15] Many patients in this study were in the older age groups.

The patients were chosen for the study as they presented themselves. Whether they were new patients or old patients made no difference. First, the diagnosis was made by a complete work-up. Then, if the patient continued to complain of any symptom attributable to gaseousness (such as the bloating, fullness, rumbling, flatulence, belching flatus, severe pressure, or pain referred to earlier) despite adequate treatment of his case, he was included in this study. Alternating cases were given a supply of one of the test tablets, to be taken four times a day for two weeks, and then a supply of the other tablets for another two weeks. The intervening cases were given the same two tablets, but in the reverse order. This was done to eliminate any advantage either the active ingredient tablet or the placebo tablet might have gained by being given first.

The final results were then obtained by determining, in each case, the two-week period during which the patient had been positively relieved of his symptoms attributable to gaseousness. Of course, no practical way was ever found to measure the actual amount of gas present in the gastrointestinal tract, nor any change in this amount occurring as the result of treatment. Certainly, the amount of gas visible on the radiographic films did not correlate with the presence or absence of symptoms. Accordingly, only the patient's statement that he had or had not been continuously relieved of what he considered to be 'gas' could be used as a criterion. However, this seemed to be a very satisfactory end-point. The tablet associated with the most positive relief in the largest number of cases was postulated to contain the active silicone-enzyme mixture. This conclusion was then verified by records previously unavailable to anyone involved in the study.

In other words, because of the subjective nature of the end-point, every effort was made to insure a completely unbiased evaluation of the clinical effectiveness of this dimethyl polysiloxane-digestive enzyme mixture.

Results

One hundred and eight (108) patients with gastrointestinal disease, who complained of gaseousness, were started on the study (Table I). Of course, certain other intervening cases with similar diagnoses, but without the persisting complaints due to gaseousness, were not included. Eight of the chosen cases failed to complete the study program for one reason or another, leaving one hundred cases for final evaluation.

These one hundred cases included thirty-nine males and sixty-one females. Their ages ranged from twenty-four years to seventy-six years. The average age was forty-nine and three-tenths years.

There were sixty-nine patients (69 per cent) who were more than satisfactorily relieved of their symptoms due to gaseousness by taking the hydrophilic silicone-enzyme mixture and who were not relieved by the placebo tablet. There was no significant difference between those who were found to have been given the active-ingredient tablet first and those who had been given the placebo first.

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* Supplied as Phazyme tablets, Reed and Carnrick, Kenilworth, N. J.

** Also supplied by Reed and Carnrick.

By contrast, thirty-one of the original one hundred cases were *not* relieved of their gaseousness by the active-ingredient tablet. Eleven of these also found the placebo preparation similarly ineffective. But the other twenty out of this thirty-one patients thought the placebo tablet *did* relieve them of their gaseousness. This is not readily explainable, perhaps, but it *is* understandable, since it is very common to find subjective benefit from placebo preparations. Many other investigators have had this experience. However, in this study, the sixty-nine per cent of good response to the active-ingredient tablet is in obviously significant contrast with the twenty per cent response to the placebo preparation.

The kinds of cases in this series are also shown in Table I. It is to be noted that both functional and organic disease are included. However, the number of cases is too small to justify any conclusion concerning the response obtainable in any one disease.

Discussion

The therapeutic action of hydrophilic dimethyl polysiloxane is based on its low surface tension and consequent ability to rupture the gas-enveloping membranes by altering the inter-facial tension. This releases the entrapped gas, breaks up the froth and the small bubbles, and allows the physiologic gas-removing mechanisms to take over. There seems to be no question that the preparation studied provides relief in this manner.

However, gas is often present in the gastrointestinal tract in much larger collections, *not* enveloped by a membrane of altered surface tension susceptible to rupture. Further, it must be recognized that some complaints deemed to be due to gaseousness by a particular patient may really have resulted from some completely unrelated mechanism. And finally, there must be some cases in which an increased tension in the gastrointestinal smooth musculature is much more responsible for

TABLE I

RESULTS OF TREATMENT FOR GASEOUSNESS WITH A DIMETHYL POLYSILOXANE-DIGESTIVE ENZYME MIXTURE

(100 cases)

DIAGNOSIS (PREDOMINANT)	NUMBER OF CASES	RELIEVED BY ACTIVE INGREDIENT	NOT RELIEVED BY ACTIVE INGREDIENT	RELIEVED BY PLACEBO	NOT RELIEVED BY PLACEBO
ORGANIC DISEASE UPPER G.I. TRACT	34	27	7	5	29
gastric leiomyoma	1		1		1
ca. of esophagus	1	1			1
hiatus hernia	6	5	1		6
gastric ulcer	2	1	1	1	1
duodenal ulcer	15	13	2	2	13
cholelithiasis	5	4	1	1	4
achlorhydria	2	1	1	1	1
hypertrophic gastritis	1	1			1
ca. head of pancreas	1	1			1
IRRITABLE COLON SYNDROME	43	27	16	11	32
ORGANIC DISEASE LOWER G.I. TRACT	13	6	7	4	9
ulcerative colitis	5	3	2	2	3
diverticulitis	4	1	3	2	2
colostomy (after removal of ca)	3	1	2		3
amebiasis	1	1			1
MISCELLANEOUS	10	9	1	0	10
regional ileitis	1		1		1
malabsorption syn.	1	1			1
retro-peritoneal lymphosarcoma	1	1			1
multiple jejunal diverticula	1	1			1
hypertonicity of GI tract	6	6			6
TOTALS	100	69	31	20	80

the symptoms of gaseousness than the relatively normal amount of gas present, even if it *is* in the form of froth.

Such situations can't be expected to respond to the defoaming action of a silicone. They must be brought under control by the other therapeutic measures aimed at the basic condition itself.

This may mean that the hydrophilic dimethyl polysiloxane-digestive enzyme mixture used in this study did not necessarily eliminate all the gaseousness by itself. Some of the relief of gaseousness could have resulted from the rest of the treatment, in the cases reported here. But, by the same token, not all of the thirty-one failures to relieve gaseousness can be assigned to the tested substance, either. Some of the cases may not have had any "froth" or gas bubbles responsible for the symptoms of gaseousness to begin with. In such an eventuality, a silicone defoaming action wouldn't even apply.

Thus, it is all the more important to remember that the therapeutic attack on "gaseousness" is a many-pronged attack, necessitated by the variety of gas-forming mechanisms. The true value of any defoaming action in the elimination of gassy froth can only be realized when it is recognized as *one* of the methods by which the symptoms of gaseousness can be eliminated.

Summary

1. Gas reaches the gastrointestinal tract by ingestion, diffusion, and putrefaction.
2. Gas may be present in the gastrointestinal tract both in large collections, and in the form of froth and entrapped small bubbles.
3. A hydrophilic preparation of dimethyl polysiloxane destroys this froth and frees the gas entrapped in the form of bubbles by rupturing their gas-enveloping membranes, enabling them to coalesce and be more readily subject to the normal gas-removing mechanisms.
4. Sixty-nine (69 per cent) of one hundred patients with a variety of gastrointestinal diseases, but each with persisting complaints attributable to excessive gaseousness, were relieved of these symptoms by a preparation containing 60 mgms. of dimethyl polysiloxane per tablet, in combination with pepsin, diastase and pancreatin digestive enzymes, as determined by a double-blind study. These sixty-nine patients were not relieved by the placebo.
5. Thirty-one patients (31 per cent) were not relieved by the dimethyl polysiloxane-enzyme preparation.
6. The combination of 60 mgms. of hydrophilic dimethyl polysiloxane and pepsin, diastase, and pancreatin in a two-phased tablet, as used in this double-blind study, proved to be a valuable and effective means of treating the symptoms of gaseousness.

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Problems Of Speech In Children

By Spencer F. Brown, M.D.

■ Speech defects and disorders of one kind or another affect a considerable proportion of school children and a somewhat smaller percentage of adults. Competent authorities estimate that 5 per cent of our school population have speech defects.[1] Many of these defects are trivial and do not warrant therapy, especially in view of the shortage of trained personnel in the field of speech correction. But at least half of them present problems of sufficient degree to merit clinical attention.

In Europe speech pathology has been regarded as a medical field, and almost all the leading specialists in this area for many decades have been physicians. In the United States relatively few physicians have concentrated in the area of speech disorders, and though there is evidence that there is increasing medical concern with these problems, a vast majority of speech problems are diagnosed and treated with little or no medical supervision or consultation. Even so, physicians who have responsibility for the care of children could do a great deal in the way of early recognition and correct diagnosis of speech problems.

To one unfamiliar with speech problems, the whole area must seem to be a jungle, a morass. Here is a child whose speech cannot be understood even by members of his own family. Here is another whose speech is always labored, halting, and difficult. Here is a third who speaks freely at times and in other circumstances can scarcely utter a word. Here is another child who is old enough to enter kindergarten and yet has not learned to speak more than a few single words. These and many others with still different sorts of problems are to be found in every large group of children. How can we as physicians best help them? This article will describe briefly the most common speech problems seen in the doctor's office: retarded speech development, stuttering, and baby talk. Other less common problems will be referred to even more briefly. The broad outlines of the therapeutic approach to these conditions will be sketched.

Retarded Speech And Language Development

In the chronological development of the child, failure of speech to appear at the expected time is highly significant. The average normal child will have two or three words by the age of 12 months. Over the second year of life his vocabulary increases, at first slowly and then more rapidly. By the time he is 21 months of age he is putting words together in combinations, and by 24 months he is making simple sentences.[2] At this age his speech is far from perfect. He has not yet learned to make many of the sounds, and strangers may find it difficult to understand him. By age 42 months, however, he should be quite intelligible to strangers though there are yet many speech sounds he has not mastered. These norms must not be rigidly applied; there is considerable variation in normal development. When, however, we find a child who is 12 full months behind the norms of single words, sentences, or intelligibility, we have a child who warrants study.

By far the commonest cause of retarded speech development is mental retardation. Children who have difficulty with all learning because of low intelligence will in general be slow in learning to talk. This fact is generally recognized by laymen and is at the same time resisted. Sometimes children with retarded speech development are hastily put in the category of the mentally retarded without adequate diagnostic study. Sometimes parents cannot bring themselves to ask the doctor about their child's slow acquisition of speech because they are afraid they will learn he is mentally retarded. Obviously, the diagnostic workup of any child with significant speech retardation will include intelligence tests and other examinations by a trained psychologist. It is not always wise or necessary to begin with these tests, however, and one must be cautious in interpreting psychometric data on a non-verbal preschool child and slow to decide that mental deficiency accounts for a child's lack of speech.

Hearing impairments are an important cause of delay in speech development. A child may have a moderate to severe hearing loss across the entire range of sounds in the speech range. In such a case there will be some delay in development of speech;

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intelligibility and voice quality may be poor. If a child has no usable hearing in the speech range—if he is deaf in the strict sense of the term—he will not be able to learn to make the sounds he has never heard without highly specialized training. A fact of considerable importance is that in at least half the cases, the parents of a two-year-old deaf child do not bring him to the physician with the complaint that he does not hear. They are worried because he does not talk. Often it has not occured to them that their child may be deaf.

There is a small group of children whose hearing is normal or nearly so for sounds up to 500 cycles per second but with a sharp drop in the hearing curve above that point, and little or no usable hearing for sounds over 2000 cycles. Such a child hears fairly well such sounds as footsteps, the rumble of traffic, and bass notes in music. He also hears relatively well the human voice, but he hears it almost entirely as meaningless noise. The higher-pitched sounds that distinguish the consonants and even some of the vowels are lost to him. The child may utter various grunts and cries in imitation of speech as he hears it, but he does not understand the speech of others nor develop speech of his own. Only careful testing by an experienced audiologist can detect this sort of hearing loss.

Certain important causes of slow speech development cannot be elicited by means of tests but rather are revealed in a careful history. These relate to the child's motivation for developing speech and to the amount of speech stimulation he has received. Speech is one of the most difficult and complex of human skills, and if it is to be learned there must be adequate reward for the child's efforts. This reward consists chiefly of favorable responses of the parents to the child's early speech attempts. If these early efforts are met with indifference or with impatience because they are not good enough, the child may in time stop trying to learn to talk. Certainly the sort of reward involved here is a subtle one, and it may be hard to determine from the history whether it has been adequate. I have found it useful to inquire in detail about matters of discipline, an area where reward and punishment are more clearly seen and understood. If this area is badly handled, one may infer that rewards of other sorts may also be awry.

It is somewhat easier to evaluate the matter of speech stimulation. A child must hear a great deal of speech from others as he learns to talk himself. If a child is brought up in relative isolation, he will likely be delayed in his talking. Deafness is only a special and extreme case of lack of speech stimulation. Some children are reared in homes where there is little talking and are slow to learn to talk. Further, what is enough stimulation to permit one child to learn to talk normally may be far from enough for another. Hence, one of the recommendations almost routinely made to parents of slow-to-talk children is to increase the amount of talking they do to their child. Reading to the child from appropriate books is especially valuable. There have been many instances where this one recommendation has made a dramaitc improvement in in the rate of acquiring language. If a child is mentally retarded he will need more speech stimulation than the average child, though he may actually be getting far less. This is not to say that increased stimulation can overcome the mental retardation but only that it can help the retarded child make full use of whatever capacities he has.

There are doubtless other important etiological factors in speech and language retardation. The role of emotional trauma is in dispute. One would have to be dogmatic to insist that emotional shocks play no part in causing speech delay, but it would require a brash overconfidence to specify just what effect such psychic insults have in any given case. Another area of controversy centers around the concept of "congenital aphasia." Some authorities feel that many children with language retardation have normal intelligence but suffer from cerebral lesions acquired before or during birth—lesions which are specific and localized to speech and language areas of the brain and inhibit normal speech development. There are valid objections to this hypothesis,[3] but there are occasional puzzling cases of language retardation in which no other explanation seems plausible. Clearly, every child with significant language retardation deserves careful study, and in many patients this study must extend over months and even years and include trial periods of therapy before a diagnosis can be reached.

Stuttering

The second speech problem to be considered is that of stuttering, and this discussion will be concentrated on the early stutterer in the preschool or early primary years. This problem has been clarified by research of the past 25 years.[4] Although many new questions have been raised, one can be quite definite about some aspects. The outlook for the early "stutterer" has brightened considerably, and a vast majority of the patients can be managed in such a way that their non-fluencies never become habitual.

Studies carried out in the late 1930's and 1940's established that all pre-school children have non-fluent speech. (*This is by no means the same as saying that all pre-school children stutter.*) The chief kind of non-fluency is repetition, which may involve single sounds, whole words, or groups of words. Repetition is present from the earliest babblings of the infant and is a feature of his beginning speech attempts, but it apparently escapes notice until the child talks enough and in long enough sentences to invite unconscious comparison with what are thought to be adult standards of speech. Now and then—in one or two cases out of every 100—someone important in the child's environment decides that the normal and inevitable repetitions in his speech are abnormal, pathological, undesirable—that the child is "stuttering." At this moment the normal repetitions typical of preschool speech become a problem which may continue and grow so great as to influence the child's whole life. Here we may note the fact that stuttering is unique in that it always begins with a diagnosis made by a layman, a non-expert in speech. But having made the diagnosis, having heard something that made him think his child was not talking properly, no conscientious parent could be indifferent.

Some parents react by trying to eliminate the repetitions. They tell the child to speak more slowly, to repeat the words without non-fluency, to stop and start over, and to "think what he wants to say." A few punish the child for repetitions. Most parents do what they refer to as "ignoring" or "paying no attention" to the repetitions. Actually they are paying the closest attention to them, but they do not talk about non-fluency in the child's presence and they try to pretend that no problem exists. Their concern over the repetitions is communicated to the child, though this may be a slow process. The parents exchange anxious looks when the child repeats words or sounds, or they look away from him. In these and dozens of other subtle ways their disapproval of his non-fluency and worry about it are conveyed.

The child responds by trying to avoid repetitions, but without success. When he finds himself engaging in typical normal effortless repetition he tenses up in an effort to push out the words without repeating. What was easy, effortless, and short (and normal) becomes difficult, tense, and longer (and abnormal). In time he begins to avoid words which caused him difficulty before, or he avoids talking for fear of non-fluency. His interruptions become longer and involve eye blinking, facial grimaces, bodily movements, and other evidences of strain. He is now in fact a stutterer, and it is to this stage of the problem that this term is properly applied. He is now in need of speech therapy, which aims at reversing the steps that brought him to a state of strain and tension and anxious avoidance in speech.

Fortunately, many children are seen while they are still repeating words and sounds without tension; they have not yet become aware of their parents' concern or have not reacted to it. In these cases no therapy for the child is necessary, and any discussion of his speech or attempts to manipulate it are contra-indicated. The management of the problem here consists in counselling the parents. Taking a thorough history gives the parents an opportunity to express some of their concerns about their child as well as supplying basic data for the treatment of the problem. The examination of the child should be confined to listening to his speech. Any condition discoverable by conventional physical examination is obviously incidental and almost always irrelevant to the problem of non-fluency and its interpretation. If one is going to explain to parents the theory herein presented, he undercuts himself in advance by carrying out physical examination procedures that cannot yield pertinent information.

The therapy, *i.e.,* discussing the problem with the parents, is an educational procedure which depends on re-orienting the parents' attitudes towards their child's non-fluencies.[5] First, much basic information needs to be given, and the research data referred to earlier are described in some detail. Then one describes the steps by which the child's normal speech behavior becomes a problem, illustrating from the history just taken. There is no need to force every case into a Procrustean bed. The variations are endless, and yet every case presents some of the crucial factors in clearly recognizable form. The parents are urged, not to "ignore" the child's repetitions but to re-evaluate them, to see and hear them as normal phenomena, to study the speech of other children of the same age, to observe the variations in non-fluency and the conditions that influence these variations. Several follow-up visits are usual. The most satisfying evidence of the success of the treatment comes when the parents cancel the appointment for the second or third follow-up because there is no longer any problem.

The theory of stuttering as given here leaves unanswered some important questions. Every child repeats, but why do only a small percentage of parents regard the repetitions as abnormal? Not every child whose parents worry about his non-fluencies develops full-blown stuttering. Why not? These and other issues remain for study, but the unsolved puzzles do not render useless the theory and the therapy based on it, though they provide a salutary antidote to one's occasional clinical dogmatism.

Dyslalia ("Baby Talk")

Of all speech problems, by far the commonest is that of the child whose speech is difficult to understand despite normal hearing, intelligence, and co-ordination. Approximately 80 per cent of the speech defective children of school age fall into this category of functional articulatory defect, popularly referred to as "baby talk" and technically as dyslalia. In some children the defect is mild, such as a faint lisp scarcely noticeable to the average listener or a minor occasional distortion of *l* or *r*. In other cases the speech is clearly defective to every listener. Though the child is intelligible, his marked baby talk is a barrier to communication and sometimes subjects him to teasing, school difficulties, and other social penalties. In extreme cases the speech is quite unintelligible.[6]

There is no single cause for this type of speech problem, but rather many contributing factors. In some instances one finds malocclusion, widely spaced upper front teeth, or other dental abnormalities. Any such condition should be corrected. An unusually narrow or high palate can occasionally be a causal factor. "Tongue-tie," or a very short lingual frenum attached close to the tongue tip, is by no means as important as is supposed by laymen and physicians alike, but in rare cases may contribute to a child's dyslalia and may need to be clipped. Environmental factors play a causal role. Disturbances in motivation and stimulation in relation to speech learning, the factors previously mentioned in the discussion of retarded speech development, may in less severe form act to cause dyslalia. Another environmental cause is defective speech in parents and others from whom the child is learning speech. Emotional stresses and strains doubtless are important here too. Though the physician and the speech therapist may be powerless to do much about such psychic factors, their presence ought to be taken into account.

Speech therapy attempts to remove whatever causal factors can be effectively dealt with and to retrain the child's production of whatever sounds are defective. The precise techniques used may vary a good deal and need not concern us here. In general they all depend upon sharpening the child's perception of his own speech so that he becomes aware of his errors and able to distinguish them from the correct sounds. Then he must learn to produce the defective sound correctly, first in isolation and then through various stages in connected everyday speech. In younger children the techniques are necessarily in the form of games, rhymes, and other speech play. In older patients more formal drills are possible. The correction of a relatively severe case may take several years.

Other Speech Disorders

The three types of speech disorders already discussed—Retarded Speech, Stuttering, and "Baby Talk" — constitute 90 to 95 per cent of all speech problems found in children, but the other 5 to 10 per cent include a wide variety of complicated and interesting problems, of which it will be possible here to touch briefly on only two.

CLEFT PALATE SPEECH

Cleft palate, for example, is a relatively common condition, being found in one in every 800 to 1,000 births. When a cleft of the lip is present, either with or without a cleft of the palate, it is generally agreed that an early surgical closure of the lip is indicated at age 2 to 4 weeks. It would seem logical that if surgical closure of a cleft palate could be accomplished before the child began to talk, his speech might well be normal and require no speech therapy. For many decades the surgical techniques that tried to translate this theory into actuality were inadequate, and in many instances caused deformities even worse than those they tried to correct. Contemporary surgical techniques have overcome the earlier difficulties, and oral and plastic surgeons can today achieve a high degree of success with most patients. They are able not merely to close the defect in the palate but to produce a palate capable of normal or nearly normal function and hence make possible excellent speech results. In many cleft palate children speech therapy is needed, however, no matter at what age their surgery was done. In many ways this therapy is similar to that of the dyslalic child, but in addition there must be special attention to tongue position, voice quality, palatal function, etc.[7]

CEREBRAL PALSY SPEECH

The conditions grouped under the general heading of cerebral palsy present quite a different problem. At present nothing can be done surgically or medically that will make any significant improvement in these children's dysarthria. There is much that can be done in the way of speech therapy, however. An experienced therapist can reduce tension in the speech musculature, teach techniques to compensate for spastic or hypotonic muscles, improve control over breathing and vocalization, and in many other ways make possible intelligible if not entirely normal speech. Greatest benefit occurs when speech therapy is combined with physical and occupational therapy, psychological and educational guidance, and pediatric supervision.[8]

Prognosis

Spontaneous recovery occurs in stuttering in perhaps 25 per cent of cases and in dyslalia in a somewhat larger proportion. In both conditions, almost all children who recover without therapy do so by the age of 8. In mild dyslalics, therapy may be withheld until age 9 to see if the child will "outgrow" his baby talk. In the more severe cases, and in all stutterers, appropriate therapy should be begun as soon as the diagnosis is made.

In cases of retarded speech development, the prognosis obviously depends on the etiology. Those cases caused by environmental factors carry an excellent prognosis. Spontaneous recovery may occur in these children occasionally. The prognosis is guarded for mentally retarded children, and is to a great extent dependent on the degree of retardation. Parents often have unrealistic expectations and may need to be told that it is seldom possible to push speech and language functioning beyond the child's other capacities.

The prognosis for clearly intelligible speech in the cleft palate child is very good; that for voice quality free from all trace of nasality is less so, but this goal is often achieved. The dysarthria of the cerebral palsied child has a prognosis varying from poor to very good, depending on the type and degree of neurological involvement.

Recurrence is practically nil in all types of speech problems except for stutterers, and even with these the percentage of relapse is low—perhaps 5 to 10 per cent.

The references throughout this article to speech therapy imply that a body of specialized fact, theory, and technique has been built up to deal with problems of defective speech. An almost explosive development has taken place in this area in the past 20 to 25 years. This growth parallels that in many other para-medical areas—social work, clinical psychology, remedial reading, occupational and physical therapy, etc. As the importance of good speech and the serious consequences of speech defects have been generally recognized, demand for specialists in speech problems has steadily grown. The American Speech and Hearing Association, the national professional organization of qualified therapists, teachers, and research workers in speech pathology and audiology, had in 1941 just under 400 members. In 1947 the membership reached 1,000, in 1952 it was 2,233, and in 1961 had risen to over 7,500. There are still far from enough experienced therapists to care for the children and adults who need help, but more facilities are constantly becoming available. In Connecticut as in almost every other state, most speech therapy is carried out in the public schools. There are also speech therapists in various rehabilitation centers throughout the state, in the Crippled Children Section of the State Department of Health, in various special clinics and schools and in several hospitals. The difficult and even most of the simpler problems need not go untreated. It is necessary that pediatricians and other physicians caring for children recognize the presence of speech problems and make appropriate referrals for diagnosis and therapy.

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Physiatric Management Of Disabilities Due To Neurologic Disease

By Thomas F. Hines, M.D., Frederick E. Dugdale, M.D., Herman L. Kamenetz, M.D., and Lee B. Greene, M.D.

Part I

■ The disabilities resulting from neurologic disease may frequently be improved by physiatric measures. Other forms of medical and surgical treatment should be used as indicated and may be supplemented by physical measures, orthetics, and rehabilitation.*

Neurologic diseases for which physiatric measures are indicated will frequently show one or more of the following clinical features:

I. Muscle Weakness
II. Diminished Range of Motion
III. Incoordination, Involuntary Motion or Spasticity
IV. Gait Abnormalities
V. Impaired Respiration
VI. Impairment of Special Senses and Functions

I. Muscle Weakness

A. DETERMINATION OF MUSCLE WEAKNESS

The presence of muscle weakness can be determined by a manual muscle test.[2] We would stress the importance of the manual muscle test in all physical examinations and particularly in neuromuscular disease. Manual muscle testing will assist in the following:

1. Diagnosis—Characteristic distribution of segmental or "pattern" type weakness may lead to an early diagnosis. The proximal weakness often found in an early case of muscular dystrophy might give a clue leading to further diagnostic tests. Scattered weakness in one or more body segments may lead to a diagnosis of previously unrecognized poliomyelitis. The characteristic weakness in a hemiparetic cerebral palsied patient with minimal or equivocal upper motor neuron signs may lead to the proper diagnosis. Hysterical or "functional" weakness can usually be diagnosed by the patient's manner of performance during the manual muscle test. The level of a peripheral nerve lesion can be quite accurately ascertained by muscle testing. The nature of the involvement can be further elucidated by electrodiagnostic procedures such as chronaxy determination and electromyography.[3]

2. Evaluation for treatment—The localization and degree of the muscle weakness in addition to its duration and potential reversibility, will indicate the correct prescription for exercise therapy or assistive devices. Low endurance, revealed by testing, may alert the physician to restrict the patient's physical activity within his fatigue capacity. This is particularly important in the lower motor neuron lesions of poliomyelitis or peripheral neuropathies.

3. Course and Prognosis—Serial manual muscle tests will reveal the natural course of the disease, the efficacy of therapy, and also indicate prognosis. In cases of slow recovery from poliomyelitis, nerve suture, or comparable conditions, muscle testing should be performed every six to eight weeks. In the chronic progressive diseases, such as muscular dystrophy or amyotrophic lateral sclerosis, similar testing will reveal the rate of progression, which in turn will govern management.

4. Orthetics—Necessary orthetic devices will be tailored to the patient's requirements on the basis of the manual muscle test. Isolated weakness of the dorsiflexors of an ankle might explain difficulties in ambulation which may be alleviated by a short

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* Physical Medicine is the use of physical agents in the diagnosis, treatment, and prevention of disease and disability.

Orthetics is the art and science of designing and applying splints, braces, and other mechanical aids.[1]

Rehabilitation includes all activities and services to and for patients during and after complete medical care, to restore the patient to his fullest functional capacity.

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leg brace. Apparatus for the upper limb for feeding, writing, and grooming also depend upon evaluation of the muscle strength and endurance factors.

5. Evaluation for Surgical Procedures—Accurate grading by manual muscle test is a prerequisite for consideration of muscle transfer. A transferred muscle will lose some of its strength and should therefore be good (G) or better to achieve satisfactory post surgical function. Optimal results are more likely to occur where a muscle "in phase"* is used.[4]

B. TREATMENT OF MUSCLE WEAKNESS

1. Physical Therapy

The most important physical therapeutic procedure for muscle weakness is exercise.[5] Once it has been determined that there is adequate potential for improvement of muscle strength and joint motion, exercise should be prescribed. It may be desirable to precede such exercise by heat, electrical stimulation, or massage. There are instances in the treatment of paralysis, the result of lower motor neuron lesions, in which the exercise program is begun too soon, carried out too vigorously, or both. In such cases the patient frequently shows signs of regression instead of progression. When this happens a re-evaluation is necessary. The patient should be taken off exercise, and after a period of rest, mild exercise progressing to vigorous may be resumed.

In the prescription for exercise we must think in terms of dosage as we would in using drugs. Exercise should be prescribed in terms of type, duration, and frequency. The kind of exercise such as passive, assistive, active, or resistive should be noted. The duration of the exercise period, the number of periods per day, and the date for re-examination should be recorded. With active or resistive exercise the load may be varied according to the patient's need.

"A simple prescription to the physical or occupational therapist for merely 'exercise' or 'muscle re-education' should be considered not only inadequate but irresponsible and dangerous. The trained therapist is capable of following an adequate prescription, but must not be expected to write the prescription."[6]

The patient's strength and endurance should be measured before the exercise program begins and at stated periodic intervals. The frequency of examination will depend upon the type of illness, the age of the patient, the amount of daily supervision, and the physical requirements of the prescribed program and may vary from one to eight weeks.

Whenever exercise is prescribed it is desirable to relate it to the basic function of the weakened muscles. For example, it is possible with a weak quadriceps femoris to walk on level ground, but difficult or impossible to perform ordinary stair climbing.

It must be remembered that one muscle may be substituted for another. When the foot is fixed the gluteus maximus acts as a knee extensor and may substitute in part or in whole for the quadriceps femoris. We must never allow substitution if improvement can be gained by exercise of the weakened muscle. When further improvement cannot be gained directly by muscle strengthening, substitute muscles may be trained and used. Substitution may therefore be used for functional improvement.

2. Bracing

There are some forms of muscle weakness which need virtually no bracing. This is particularly true of muscles which are not supporting or stabilizing a part, which are not needed to work against gravity, or which are not being pulled by a spastic antagonist. On the other hand there are many instances in which a weak muscle, if unsupported or unprotected by a brace, may lead to contracture, permanent shorting, overstretching, pain, increased weakness, and skeletal deformities which may later complicate treatment. Braces are used for the following purposes: to

a. immobilize a part and thus prevent overuse or too early use of a muscle
b. give support or stability to a weak muscle
c. prevent overstretching of a muscle
d. correct or prevent deformity
e. improve function
f. relieve or prevent pain
g. prevent abnormal motion of joints.

3. Surgery

Various orthopedic or neurosurgical procedures may be considered in muscle weakness. As typical examples of these we may cite:

a. The use of a triple arthodesis in conjunction with a peroneal transfer to the dorsum of the foot for a flaccid drop foot. The triple arthrodesis stabilizes the foot medially and laterally. The transferred peroneal muscle can act as an ankle dorsiflexor.[4]
b. Anterior repositioning of the ulnar nerve following injury about the elbow to obtain adequate length for repair.

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* Ambulation consists of two phases—swing and stance for each lower extremity. By electromyography and camera studies, the activity of each muscle of the lower extremity has been studied for activity during each of these phases. An extensor which is active at the same time as a flexor during swing or stance is considered "in phase."

4. Medication

There is little clinical indication for the use of drugs in muscle weakness. Prostigmine and related drugs are used in myaesthenia gravis and potassium in familial periodic paralysis. The rigidity of Parkinsonism may be relieved by appropriate medication thus improving the patient's mobility and muscle strength.

5. Psychiatry

Psychiatry may be of value in the diagnosis and management of muscle weakness as seen in hysteria and other psychogenic conditions.

II. Diminished Range Of Motion

A. DETERMINATION OF JOINT RANGE OF MOTION

Joint range of motion may be passive, assistive, or active. In passive motion the physician or therapist moves the part and the patient makes no attempt to help. In assistive motion the patient moves the part with the assistance of the physician or therapist. Finally, in active motion the patient moves the part by himself.

It is important before approaching the treatment of a restricted joint that the bilateral joint range, both active and passive, be recorded for comparison and as a baseline. We prefer to use as a zero position for all joints the standing neutral position. The degree a joint can move before pain arises should be noted as well as the presence of muscle spasm, rigidity, or spasticity. In examining a joint with diminished range of motion it is important to determine the structure or structures involved, i.e. skin, muscle, tendon, ligament, capsule, joint surface. These determinations are an integral part of the manual muscle test.

B. TREATMENT

Mobilization of a joint may be obtained by (1) active exercise (2) passive stretching—manually or by tractive apparatus (3) by surgery. When attempting to increase the range of joint motion by any method, care must be taken not to produce bone or soft tissue injury. When pain is associated with joint mobilization heat, massage, electrical stimulation, or appropriate medication should be used as preliminary treatment. If after a reasonable period of manual or mechanical mobilization, a functional range of motion has not been obtained, then surgery may be the treatment of choice.

III. Incoordination, Involuntary Motion, And Spasticity

Coordination is the interplay of muscles to produce harmonious motion with the minimum expenditure of energy.

Incoordination may be caused by:

(a) Muscle weakness
(b) Limitation of motion
(c) Spasticity
(d) Spinal cord involvement with loss of proprioception or other sensory loss
(e) Cerebellar, basal ganglion, or other cerebral involvement.

Obviously, spasticity and involuntary motion of various kinds—rigidity, muscle imbalance, and various dystonias—will result in or increase existing incoordination.

Etiology, site, and degree of involvement should be established and evaluated and, if possible, a provisional goal set. The management of these impairments will sometimes be similar in spite of the varying etiologies.

In addition to the pharmaceutic, surgical, and psychiatric therapies, physiatrists frequently have recourse to the following:

(1) Heat
(2) Exercise
(3) Massage
(4) Cold
(5) Electrical stimulation
(6) Braces

Clinical signs and symptoms most frequently encountered are tremor, rigidity, spasticity, and athetosis.

When the cause is organic there is relatively little that can be done for tremor; we have to try drugs or neurosurgery (pallidectomy). In some cases the function of one hand can be improved by the simultaneous voluntary effort of the opposite hand.

Rigidity typically is asymmetric in nature and does not involve agonists and antagonists to the same degree, i.e., in Parkinson's syndrome often the biceps brachii shows rigidity while the triceps is relatively uninvolved and this may be unilateral. Careful screening of the muscles showing rigidity is important for treatment. Patient function is often improved by strengthening the relatively uninvolved muscles opposing those with increased rigidity. Contractured regions resulting from rigidity should be mobilized.

In occupational therapy, functional patterns of use are stressed, particularly in Activities of Daily Living (ADL). Only in rare cases is bracing of help. With pronounced wrist and finger flexion, a brace to stabilize the wrist and provide extension assistance to the fingers can be used.

For dystonic motions in general, braces are used to give the patient functional unidirectional motion. In addition, friction is often applied to the joints and in this way undesirable motions are eliminated and function improved. A friction "feeder" may enable a severely involved patient to feed himself. Similar concepts may be applied to joints of all extremities. In general, exercise is not effective for dystonic motion. However, in recent years several systems of exercise have been developed based on the utilization of normal and pathologic reflexes as well as sensory phenomena (Fay, Kabat, Bobath, etc.). Conclusive evidence of beneficial results has not yet been furnished. Newer neurosurgical techniques may reduce dystonic motions.

Spasticity—Heat in various forms—packs, bottles, radiations, etc.—has sometimes been found to decrease the degree of spasticity. Conversely, the use of cold—ice, ethyl chloride spray, cold baths—temporarily reduces spasticity. Cold appears to be more beneficial.

While a great deal of controversy exists as to the advisability of stretching of spastic muscles, we have been able to demonstrate clinically its effectiveness. Elongation of a spastic muscle will reduce contracture and allow the antagonists to be strengthened, thus improving function. If a spastic triceps surae can be stretched to its maximum, the range of ankle dorsiflexion is increased and it is often found that voluntary strength can be gained in the dorsiflexors. A dynamic brace will be an adjuvant to this stretching.

An additional method of muscle stretching is by the use of electrical currents. There is some controversy as to the type of current to be used and whether the agonist or antagonist is the muscle to be stimulated. There are two principle methods: (a) tetanizing fatigue of the spastic muscle (b) rhythmic stimulation of the spastic antagonists for better strength and action; we prefer the first method. The spastic muscle is held at its maximum length and stimulated by a tetanizing current until it is felt to relax. The necessary time of stimulation may be from 5 to 20 minutes and the beneficial effect may last up to 48 hours. Continuation of this type of therapy will depend upon the duration of muscle relaxation obtained.

Tetanizing the spastic thigh adductors may give enough relaxation to allow the patient to walk without a scissor gait. This would also allow the examiner to evaluate more accurately the strength of the antagonists (i.e. the hip abductors). This is a procedure of particular value when an obturator neurectomy is being considered. Similar routine may be applied to other regions. One of us (TFH) has noticed that in cases of spastic hemiplegia, tetanizing electrical stimulation of the involved dominant upper limb has resulted in severe headache or even convulsion subsiding upon discontinuance of this therapy; such therapy is therefore contraindicated.

Exercises utilizing reflexes seem to be of somewhat greater value in spasticity than in dystonias. A program of strengthening the muscles which remain under voluntary control will particularly aim at those muscles and muscle groups which are antagonists to the spastic muscles.

In addition to the treatment of the involved regions, an attempt is made to develop the patient's remaining muscles and abilities; in a paraplegic we strengthen the upper extremities for ambulation, ADL, and other movements.

In spasticity, braces may be used for: (a) stretching (b) improved function (c) prevention of contracture. In a spastic hand lacking extension of the fingers, a dynamic extensor assistive brace will improve function. A long leg brace locked at the knee will overcome knee flexion due to hamstring spasticity and enable the wearer to ambulate. Prevention of constant flexed joint position will eliminate contracture.

Pharmaceutic agents have so far not been found to have a direct effect on muscle spasticity. The tranquilizers, however, may decrease the anxiety and tension often noticed in such patients and secondarily reduce the degree of spasticity.

Surgery may consist of tenotomy, neurectomy, rhizotomy, chordotomy, or various interventions at the level of the brain.

(This is the first of a series of two articles.)

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Cervical-Lingual-Masticator Myoclonus

A Reaction To A Non-Halogenated Phenothiazine

By **William F. Eckhardt, Jr., M.D.**

Introduction

■ Major or minor extrapyramidal symptoms may occur in 60 per cent of patients given large parenteral, daily doses of prochlorperazine (Compazine)* for the management of mental illness.[1] The rarer syndrome of acute psychomotor tremors, dystonic spasms of the face and jaw, myoclonic opisthotonus and oculogyric crises has been recently described in certain individuals who receive small amounts of the halogenated phenothiazine compounds (prochlorperazine, perphenazine, chlorpromazine, trifluoperazine and fluphenazine).[1,2]

Delay and co-workers have described and named this rather specific neurological response to these compounds, cervical-lingual-masticator myoclonus.[4] The halogenated phenothiaide drugs have been the only compounds reported to cause this alarming but rapidly reversible specific myoclonic reaction.

It is my purpose in this brief communication to describe a patient in whom a non-halogenated phenothiazide (thiethylperazine dimaleate) (Torecan)† caused a similar myoclonic reaction.

Case Report

A thirteen year old white girl with no prior history of neuromuscular disease was given thiethylperazine dimaleate for treatment of mild nausea and vomiting secondary to a mild viral gastroenteritis. She took four ten milligram tablets over a three day period. Her symptoms of nausea quickly disappeared. On the afternoon of the third day, she noted marked jaw myoclonus, with deviation of her jaw to the left, extensor spasms of her cervical neck muscles, and uncontrollable upward elevation of both eyes. There was no generalized myoclonus, cog-wheel rigidity or tongue stiffness. The amount of diethylperazine that she took was less than the recommended dosage of thirty milligrams by mouth each day.

Her tonic spasms and eye deviations immediately disappeared after administration of 100 mgms. of secobarbital intravenously. The patient had never received halogenated phenothiazines previously.

Discussion

All previous cases of cervical-lingual-masticator myoclonus have occurred in patients who received various halogenated phenothiazide drugs. Thiethylperazine dimaleate is a non-halogenated phenothiazide derivative that has been used to treat nausea, vomiting and vertigo of diverse causes. It is clear that the basic phenothiazine ring structure induces this peculiar dystonic reactions in individuals who have this unique central nervous system sensitivity.

Summary

1. Cervical-lingual-masticator myoclonus has previously been regarded as a specific toxic reaction to a halogenated phenothiazine drug.

2. A case is reported where this myoclonic reaction was induced by small doses of a non-halogenated phenothiazine, (thiethylperazine dimaleate) (Torecan).

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* Prochlorperazine (Compazine), Smith, Kline & French.

† Thiethylperazine dimaleate (Torecan), Sandoz.

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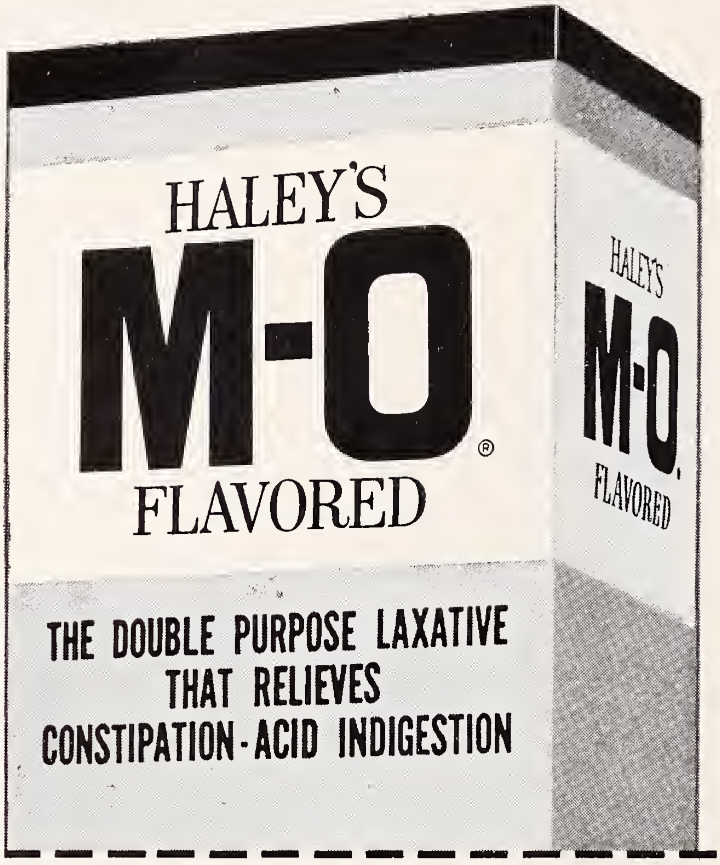

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JUST ONE MORE TIME

Almost every day or two we seem to run across a notice that some town or city is about to "take advantage" of funds which have been made available by a higher echelon of government to be used for civic improvements and other purposes at local level. It is interesting to note that the press (as well as most community officials) regularly refers to the bestowing of state and federal money under these assistance programs as "grants" from the more centralized to the more dispersed political divisions.

We suppose it may be splitting hairs to suggest that it could be fuzzing things up a little to keep representing that the philanthropic donations made by private foundations and other agencies are one and the same with these handouts from the public coffers in a state capitol or in Washington, D. C. But, as *The Wall Street Journal* has pointed out on more than one occasion, the payments for all expenditures authorized by government *do* come from a single source—the taxpayers' pockets—whether the outlays are called grants, appropriations, assistance or something more esoteric.*

Not long ago, for instance, we heard a couple of fellows arguing heatedly about so-called "Federal aid to education." The proponent of such aid rested his case largely on his premise that state and local authorities have about reached the limits of their taxing powers. "Today, they simply can't get the needed funds from the people in their own areas," he contended, "the homefolks just don't have any more to give and so it's necessary to get Federal help or fall down on the job!"

The other chap wouldn't go along with this contention, though. "If it's true that there's no more money to be milked out of the citizen at home—right where he lives," he retorted, "then how can some agency hundreds or thousands of miles away manage to extract from him something you say he just doesn't have? That makes no sense at all to me!"

As we said, it probably is rather a waste of time to try to keep our definitions straight in matters like this, but there *does* seem to be a certain amount of sentiment among the electorate to give finding out "the facts" about taxing and spending a bit of a whirl. A lot of folks claim to be baffled as to how Congress (at the urging of the Administration) can vote to reduce the government's sole source of revenue and, at the same time, be voting to lay out a lot more money to pay for all those "grants" and such which are being planned to bring bigger and better benefits to everyone who lives on "Main Street, U.S.A."

We admit our relative incompetence to discuss these complex considerations but we are certainly willing to learn. We sure do wish that some of our presumably informed political leaders would go over with us just once more how it's possible to get blood out of a stone—whether the squeeze is put on by a minor official down at city hall, or by some "higher-up" who holds forth on the banks of the Potomac.

W.R.R.

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* Esoteric: Designed for, and understood by, the specially initiated alone.

SUCCESS OR FAILURE?

There seems to be a kind of political thinking making the rounds these days which just might develop into something of more than passing concern to all of us. The thing we're talking about is a little bit hard to define precisely, but it keeps coming to our attention as a consequence of perusing a continuing series of magazine articles which claim to be based on interviews with "key legislators" in the nation's capitol. Under quite a variety of provocative titles ("What's Wrong With The 88th Congress?", "What's Holding Things Up On The Potomac?", etc.), the interview pieces record the opinions of senators and representatives (mostly anonymous) as to the pros and cons of sundry major legislative proposals now on the agenda and give the reader the "inside dope" on what's likely to become of the bills and why.

It's very interesting, of course, to get the personal views of such important public figures on civil rights, the test ban, "medicare" and so on, but we find it rather disconcerting to learn from these men

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what the *real* basis is likely to be for many of their supposedly considered judgments. One interviewee opines, for example, that the President is "holding back" on a certain bill because it "wouldn't do him any good next November," and another says that he (a prominent senator) hopes no one will "smoke him out" on a controversial proposal lest it unfavorably affect his chances at the polls in 1964.

In the last couple of years we think we've acquired a smattering of information about practical politics and have probably had more than an average amount of personal contact with people in government at various levels. While it has occurred to us, from time to time, that a number of legislators may not be at all what they seem, either because they are apparently more concerned with politics than with statesmanship or because they really don't know very much about the matters which come before them, you'd never find us engaged in wishing the President "bad" in anything he is called upon to do for the country or running down a member of Congress just because he belonged (in our opinion) to the "wrong" party.

We're perfectly willing, too, to put up with any reasonable amount of "campaign oratory" at the proper times. That's all part of the game. But in between elections, and especially while legislatures are in session, we'd hate to think that more than a handful of our lawmakers were looking out for themselves first and putting the public interest in second place as a matter of regular policy. After all, it isn't likely to do *anyone* much good if the nominal leaders in government largely tailor their leadership to fit a pattern of political expediency.

If our system of representative government is to survive, it seems to us that the lines of communication between the elected and the electorate must operate effectively in both directions, and that certain basic obligations of mutual responsibility must be mutually discharged. The voter should be expected to tell his representative *how he thinks* on all important issues and, in turn, the representative should be expected to explain to his constituents periodically *why he acted* on their behalf in the way he did.

We guess we've lost a good deal of the spirit of rabid partisanship we used to have for the "home team" in days gone by, and are presently much more interested in supporting the man who has deep convictions and the courage to stand up for them than we are in geting behind some popular fellow who wants so badly to be loved by just everyone that he's usually afraid to move off a dime in the discharge of his duty.

W.R.R.

SUMMARY OF ACTIONS
COUNCIL MEETING
Wednesday, July 17, 1963

I. Attendance

Present, in addition to the Chairman, Dr. Martin, were: Drs. Pitock, Cullen, Hess, Weise, Sr., Scully, Wilson, O'Connor, Bradley, Grendon, Grant, Shepard, Weber, Jr., Dean, Ciccarelli, Seigle, Gevalt, Egan, Spitz. Also present: Mrs. Lindquist, Dr. Richards. Absent were: Drs. Gilman, Goldberg, Gardner, Davis, Phillips, Hughes, Abbot, Caplan, Hastings, Medbury.

II. Routine Business

Approval Of Minutes

It was VOTED to approve the minutes of the meeting of June 27, 1963, as printed and distributed.

Life Membership

It was VOTED to approve an application for Life Membership (effective January 1, 1964) of William H. MacCready, Windsor (HCMA), an eligible Active Member.

It was VOTED to extend the required date for payment of 1963 dues (8/1/63) for Hubbard Lynch, Fairfield (FCMA), until the Board of Trustees of the Fairfield County Association has acted upon the question of Dr. Lynch's exemption for payment of 1963 dues a/c physical disability. Dr. Lynch was elected to Life Membership at the June 27th meeting of the Council, but his exemption from payment of dues on that account would not become effective until 1/1/64.

Advisory Committee To Accident Prevention Study

In view of Commissioner Franklin M. Foote's advisement that this Committee would be needed to participate in the follow-up and tabulation of the accident prevention study later this year, no action was taken to dismiss the committee at this time.

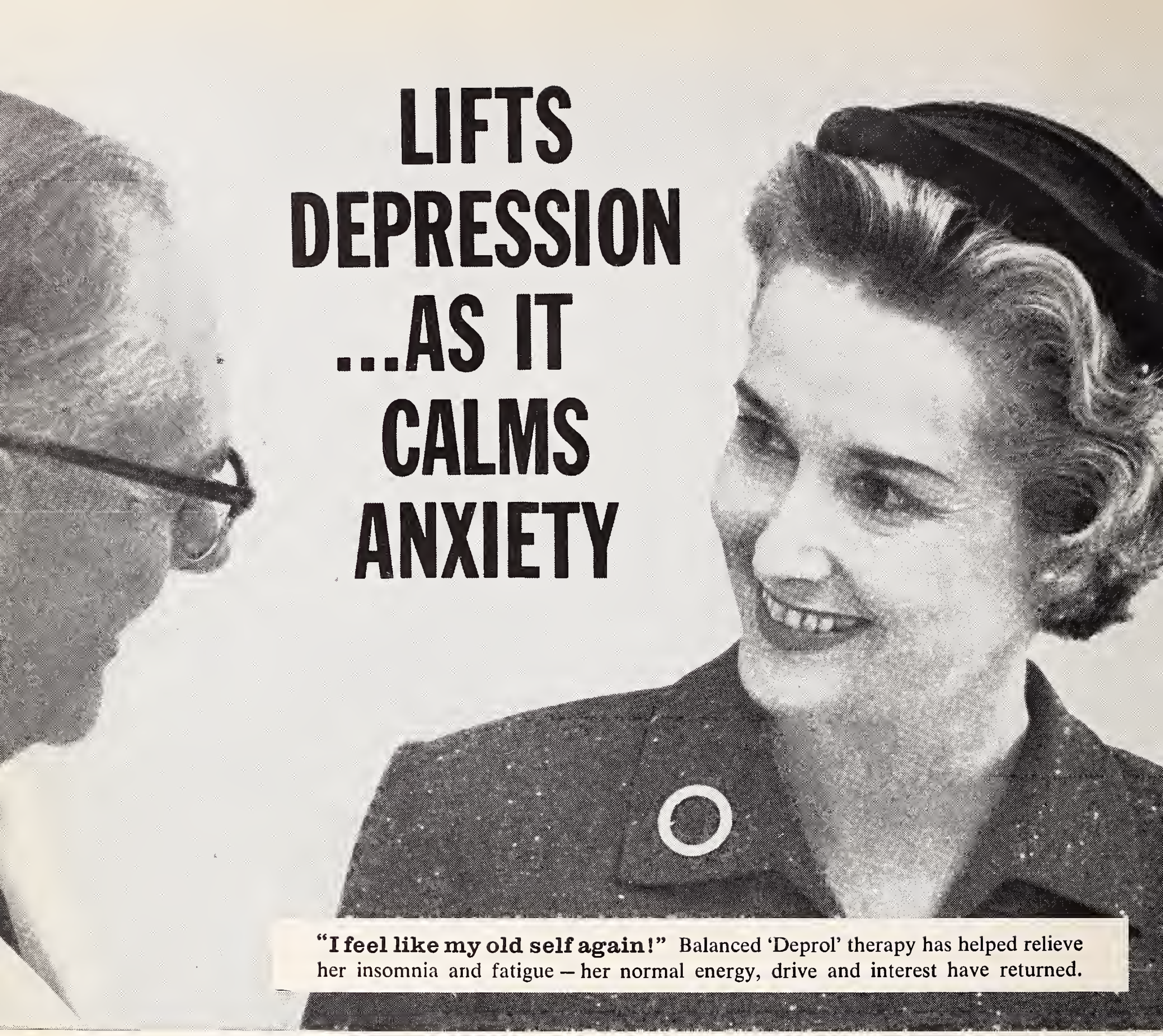
Date Of Next Meeting

It was VOTED that the Chairman and the General Manager schedule the next meeting of the Council, it being understood that no meeting will be held in the month of August unless it becomes necessary.

III. Old, New And Special Business

Committee On Preliminary Study Of Censorship Questions

Michael R. Scully, Bridgeport, Chairman, filed the report and recommendations of the Committee on the appeal of a member against a disciplinary ruling of the Board of Directors of the Hartford County Medical Association. A review hearing on the appeal had been held by the Committee on July



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1, 1963. Acting as the Board of Censors of the Society, the Council VOTED to adopt the report and recommendations of the Committee. As called for in the last of four rulings adopted by the Council on the member's appeal, the Chairman of the Board of Directors of the Hartford County Medical Association and the member are to be notified of these rulings of the Council by the Chairman, Dr. Martin.

In other actions relating to these rulings, it was VOTED: (1) that notification of all concerned with the Council's rulings on this appeal be made in writing by registered mail, return receipt requested, and that no other or extraordinary procedure be followed in making such notifications; and (2) that the Hartford County Medical Association be requested to notify the Chairman of the Council when the member has fulfilled his responsibilities as set down in Ruling No. 1 and Ruling No. 2 of the Council's decisions.

Report Of Delegates To Council Of N.E. State Medical Societies

Oliver L. Stringfield, Stamford, Chairman of the Delegates to CNESMS, filed a report on the Annual Meeting of the N.E. Council on April 28, 1963. It was VOTED to accept Dr. Stringfield's report, which included a single recommendation that M. David Deren, Bridgeport, be invited to bring the CSMS Council up to date on the Beacon Investing Company (sponsored by CNESMS) and a new "insurance phase" of its New England Physicians' Retirement Program.

Connecticut Medical Service, Inc.

Other than receiving a general progress report on developments in the Society's legal action against the CMS Corporators regarding the election of the Council's nominees, there was little CMS business to come before the Council at this meeting. It was VOTED to accept, with appreciation, notice of a resolution recently adopted by the New Canaan Physicians Association that endorsed "the position of the Connecticut State Medical Society in its negotiations with Connecticut Medical Service in re proper representation for organized medicine in the election of the executive officers of CMS, Inc."

Communication—Connecticut Academy Of General Practice

A letter from the CAGP, signed by its president, Frank F. Northman, M.D., was addressed to the Council and was read by the General Manager. In the letter, the Board of Directors of the Academy protested the statements regarding physicians and medical practice (especially concerning G.P.'s) which were attributed to a CSMS member in an article appearing in the June 15, 1963 edition of *The Saturday Evening Post,* and urged the Council "to refer this matter to an appropriate committee to investigate whether this physician's actions and statements (in the *Post* article) did not actually violate the ethics and deportment of our State Medical Society." It was VOTED to inform Dr. Northman and the Board of Directors of CAGP that all matters of discipline concerning a member of the Society receive primary consideration at county level and that, therefore, the Council is referring the Academy's letter of complaint to the New London County Medical Association for evaluation and reply to the CAGP Board.

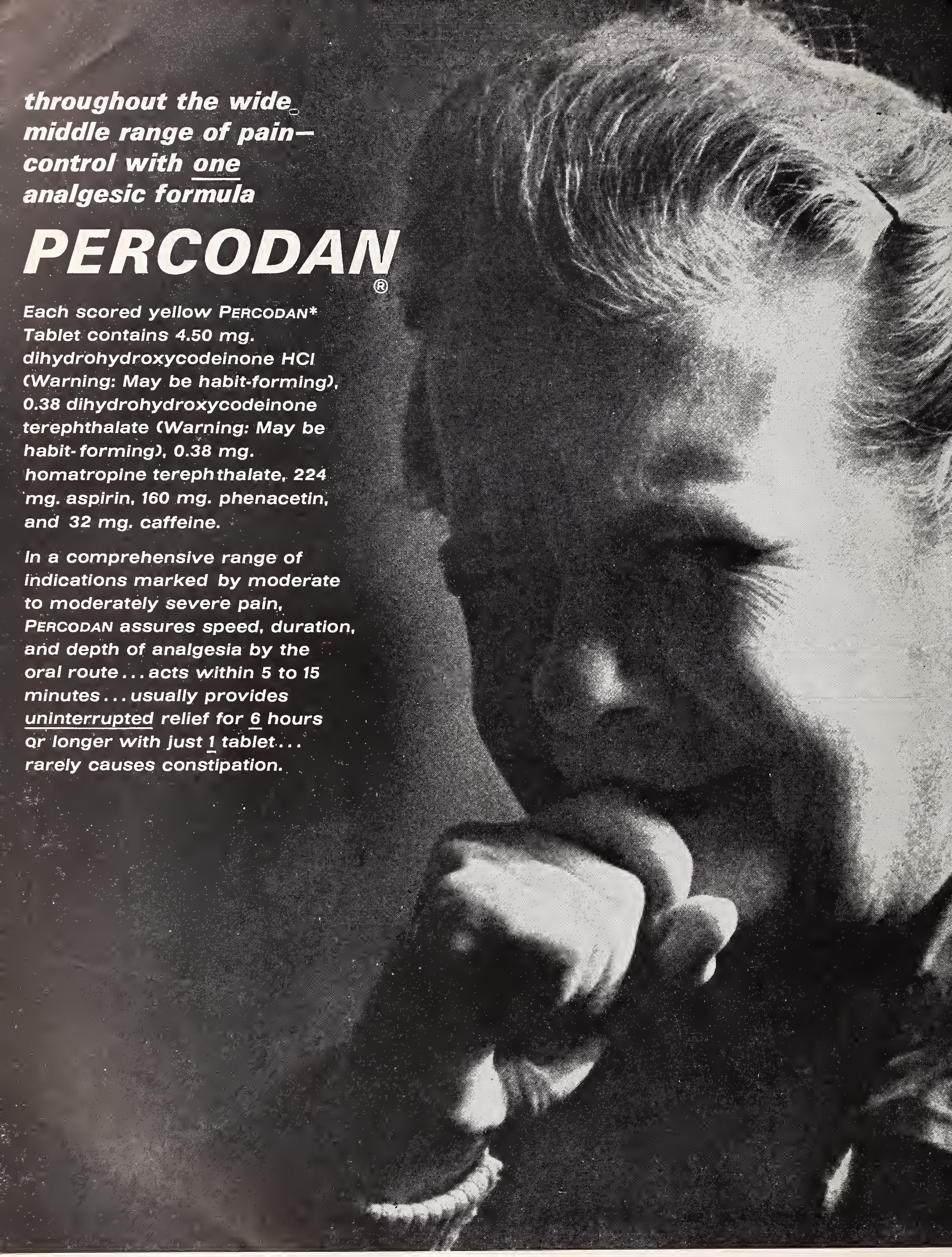
"The President's Page"—CONNECTICUT MEDICINE

It was VOTED to direct the General Manager to obtain reprints of the "President's Page" in the July issue of Connecticut Medicine for distribution to all Student Members of the Society, medical school libraries, and the libraries and staff bulletin boards of the general community hospitals in Connecticut. Titled: "The Intern and the Community Hospital," the editorial was written by the Society's President, Morris P. Pitock, Bridgeport.

Request—The Hartford Hospital

In a letter written by Frederick L. Nichols, M.D., Secretary of the hospital staff's Executive Committee, the Council was asked to furnish "a legal opinion from the Connecticut State Medical Society on the medical-legal aspects of a Section on Psychology (within the hospital's Department of Psychiatry) in reference to their (?) activities." Since the Council members appeared to be in doubt as to the proposal regarding a "Section on Psychology" itself, and as to the specific request which was being made of the Council, it was VOTED to request Stewart P. Seigle, Councilor from HCMA, to obtain from Dr. Nichols the full details of the proposal, in writing, and to report this information to the Council at its next meeting.

N.B.: *The foregoing is a summary of the proceeding and actions of the Council on July 13, 1963. Detailed minutes of the meeting are on file at 160 St. Ronan Street, New Haven, for perusal by any interested member of the Society.*



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1963 MEETINGS

September 25—180th Semi-Annual Meeting of the Hartford County Medical Association will be held on Wednesday, September 25, 1963 at the Hotel Bond, Hartford, Connecticut. The Business Meeting is scheduled for 5:00 P.M.

September 27—38th Connecticut Clinical Congress to be held at the Yale-New Haven Medical Center.

October 13-16—Nurses Conference, sponsored by District I, of the American College of Obstetricians and Gynecologists will be held at the Hotels Statler and Bond, Hartford, Connecticut, from Sunday, October 13th through Wednesday noon, October 16th.

October 16-19—Annual Meeting of District I, of the American College of Obstetricians and Gynecologists will be held at the Hotels Statler and Bond, Hartford, Connecticut, from Wednesday, October 16th through noon on Saturday, October 19th.

October 24—180th Semi-Annual Meeting of the New Haven County Medical Association will be held on Thursday, October 24, 1963 at the Waverly Inn, Cheshire, Connecticut. The Business Meeting is tentatively scheduled for 2:30 P.M.

October 25-26—Regional Meeting of the American College of Physicians, New England States, Quebec and Maritime Provinces, Hotel Statler, Hartford, Connecticut.

November 13-14-15—New England Postgraduate Assembly to be held at Statler Hotel, Boston.

December 4—Annual Meeting of the Connecticut Society of American Board Surgeons, Inc. at Les Shaw's, 70 Pond Lily Ave., New Haven, at 3:00 P.M.

180th SEMI-ANNUAL COUNTY ASSOCIATON MEETINGS

September 25—Hartford County
October 2—Fairfield County
October 3—New London County
October 8—Litchfield County
October 10—Middlesex County
October 15—Tolland County
October 17—Windham County
October 24—New Haven County

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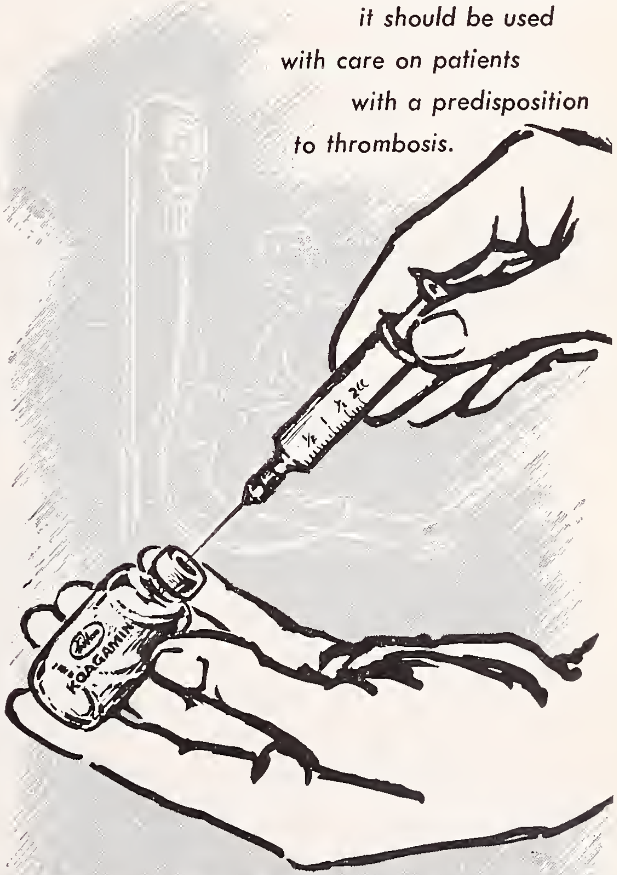

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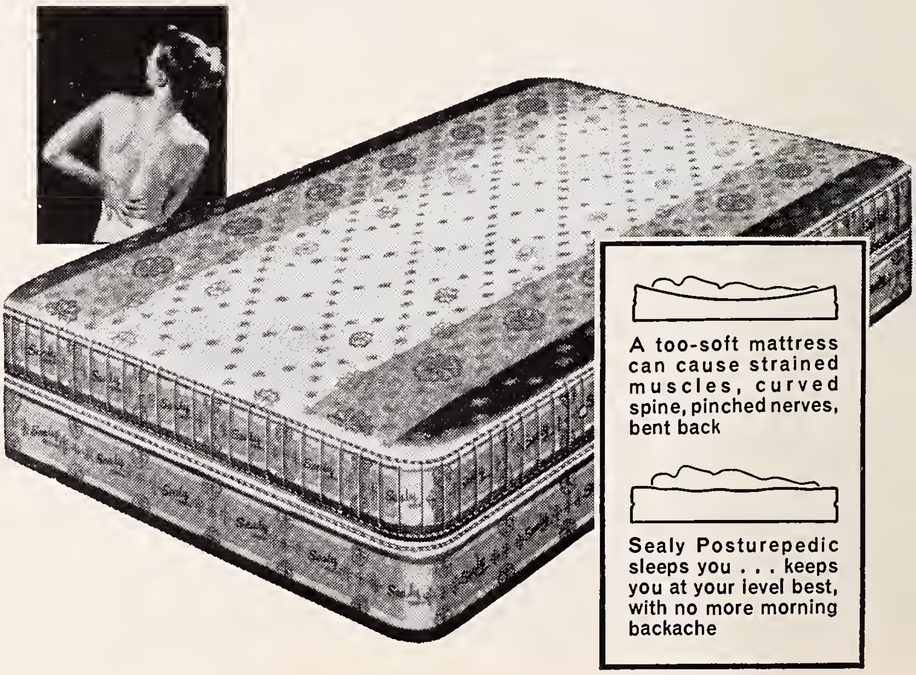

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Special Article

Tax Deductible Investments For Physicians

By Gustave Simons

■ Some time ago, during the course of a study of tax incentives that I was making for the Department of Commerce, I made an extensive survey of the relative tax burdens on various occupations, industries and professions. I learned that physicians, prize fighters and authors shared the dubious distinction of being the most heavily taxed groups of all. The reasons for the melancholy position of this unholy trinity were obvious. Each of these occupations is marked by many years of relative penury and a relatively short period of high earnings if the practitioner is lucky enough to achieve high earnings at all. Together with this concentration of a few high bracket years was the absence of the advantages enjoyed by the average corporate executive. For the physician, there are no pension trusts, no profit sharing trusts, no stock options and no tax free expense account.

This made entrance into the magic world of capitalism particularly difficult for physicians. A doctor wanting to buy stock on the New York Stock Exchange had to earn money and pay a tax *first* and then buy the stock with what was left, also allowing for living expenses, non-deductible life insurance and the like.

On the other hand, the lucky business executive, who is the beneficiary of a qualified profit sharing trust or pension trust, could have a portion of his compensation placed into a trust for his benefit and pay no tax on this contribution by his employer (who could deduct the contribution in exactly the same fashion as if cash compensation was paid). Moreover, the earnings on the trust funds would be tax free and thus "rolled over" or compounded at an accelerated rate. There was a tax only when the funds were finally distributed to the executive. If distributed over a long period of years, probably at a time when the executive's tax brackets would be lower, the distribution would be taxed as ordinary income. But if the executives took the benefits in a lump sum in one year on termination of employment for any reason, there is only a capital gains tax at a maximum 25% rate. Furthermore, if the executive died before retirement or before full distribution was made, the benefits passing to his family would be received free of Estate Tax.

Let us see how this works out, in practice. Profit Sharing Trusts, as the name implies, are trusts where the contribution is some stated proportion of the profits of the employer. A $50,000 a year executive for whom the full 15% or $7,500 contribution permitted by law was made each year, would have $140,000 after taxes at the end of fifteen years, if the money in the trust were invested at 6%. The same sum invested in the same way, by a physician in the same tax bracket would in the same period of time accumulate only a little under $55,000 after taxes. In other words, the physician, merely because he was a physician and not an employee-executive would have to work for 40 years in order to accumulate what his profit-sharing executive friend could gain in 15 years.

With pension trusts, the amount contributed by the employer is not limited to a given percentage of cash compensation. Thus, with larger tax free contributions being possible, the advantage of the executive over the physician is even greater. This has made it possible to provide income and retirement benefits approximately four times as great for a 35 year old executive with an earning power of $35,000 as for a physician of the same age, same earning power, same investment skills but without the tax shelter provided by Federal Law to corporate executives and denied to self-employed physicians.

To overcome this injustice, a bill was introduced in Congress, the now famous, or infamous, Keogh Bill. In the Fall of 1962, after many years of heated battle, the Keogh Bill was finally enacted, but alas, its form was so emasculated by amendments as to render its benefits illusory.

A physician acting under the Keogh Bill would suffer many disadvantages in comparison with the executive benefiting by the orthodox profit sharing trust or pension trust. Under the Keogh Bill, $2,500 would be the maximum which a physician could set aside for himself. Even then, the full contribution would not be deductible but only an amount equal to 5% of his income or $1,250 *whichever was lower*. This is only one-sixth of what could be deductibly set aside in a profit sharing trust for a $50,000 a year executive.

Moreover, under an orthodox trust, an executive can take his benefits after a period of years or when quitting his job or could even let benefits accumulate beyond his normal retirement age if he stayed on the job. Under the Keogh Bill, the period of distribution was strictly limited and could not be before insurance age 60 or after insurance age 70 in the absence of death or complete disability. Any other choice of distribution date involves a severe tax penalty.

---

* Mr. Gustave Simons, Financial Consultant and member of the New York Bar, New York, New York.

Distribution on a capital gains basis is not available under the Keogh Bill but is available under an orthodox pension plan although a change in this provision has been suggested by the President. The most severe disadvantage lay in the strict limitations on permissable forms of investment under the Keogh Bill. Profit sharing and pension trusts are allowed many forms of investment not available under the Keogh Bill and it is possible to achieve, in proportion to security, far greater return in the orthodox type of trust.

There are many other disadvantages under the Keogh Bill, but I hardly think it is necessary to enumerate further. Does this leave the physician without hope? Fortunately, it does not, particularly if he is lucky enough to practice in Connecticut. The history of how corporate pension and profit sharing benefits were made available to physicians is a long story in itself. It involved the stirring victory by Dr. Arthur Kintner in the courts of the United States and was culminated by the enactment by more than twenty states of the so-called "professional corporation" laws. Connecticut was one of these states. Under the Connecticut law, three or more licensed individuals, such as physicians, architects, engineers, lawyers or dentists, can organize a partnership or group having the centralized management, continuing existence and individual immunity from liability for the mistakes of other partners, necessary to qualify for a valid pension or profit sharing trust under our tax laws. In fact, the first medical group to obtain a favorable voluntary ruling on its pension plan from a reluctant Treasury was The Colony Medical Group in Meriden, Connecticut.

This means, that by taking the proper business and legal steps, Connecticut physicians may now qualify to acquire through pension or profit sharing trusts; stocks, bonds, real estate, insurance or annuities, all on a tax deductible, tax exempt basis.

But the opportunities do not cease there. Suppose a physician does not care to enter a group or suppose he wants to build capital over and above that being supplied by a group Trust, what then? Well first of all, the physician must think in terms of his ultimate financial goals. These will include a retirement reserve for himself and insurance protection for his family. While the cost of life insurance protection is tax deductible when provided through a pension or profit sharing trust, it can also be made tax deductible *outside* of one of these trusts. This can be done by making a loan secured by the cash value of a policy from the insurance company itself or from a bank and by using this loan to pay the premiums. The loan is ultimately repaid from the proceeds of the policy. Meanwhile, the interest is tax deductible. Although the Treasury favors legislation limiting bank financed or minimum deposit insurance, similar proposals have been made and have been defeated ever since 1955 and there is little chance of enactment now. The proceeds of the insurance policy are free from income tax and if the policy is given to the physician's spouse, the proceeds are not subject to Estate Tax either. The excess of insurance proceeds over premiums paid derives from the interest or other income earned, on a tax favored basis, by the insurance company. This excess, as I have just said, is tax free when received. Connecticut insurance companies have again taken the lead in this type of insurance by designing policies with lower commission rates initially for the insurance agent and with higher early cash values. This makes it possible for physicians to carry insurance on a much more favorable after tax basis than offered by the orthodox procedure. Two, three or even four times as much coverage can be provided by the same after tax dollar in this fashion. Any physician with a family should give serious consideration to this type of coverage.

But suppose in addition to benefiting his family, the physician wants to build capital for himself by further tax deductible investments. In the desperate search for capital growth, many physicians invest in corporations organized locally by friends or relatives to develop some new gadget or service only to find that, as with speculative enterprises in 9 out of 10 instances, the business fails. The worst part of the situation is that a loss on the investment in such a corporation, either by way of purchase of stock or a loan of money, is not deductible from ordinary income except to the extent of $1,000 a year (with a five-year carry over). This is because the loss has to be balanced off against capital gains before even the $1,000 deduction can be taken. However, if the investors take advantage of a provision that was added to the law in 1958 and set up the new corporation as a so-called "Subchapter S" or tax option corporation, the loss usually inherent at the beginning of even an eventually successful operation can be deducted from the individual taxable income of the physician. When the corporation starts making money, the net income is similarly taxable to the stockholders. Since the bracket of a physician individually is apt to be higher than that of a corporation, the best procedure is to revert to ordinary corporate status with a view to eventually selling out at a capital gain. Moreover, enormous gift and estate tax savings can be effected by proper tax planning with this type of investment.

Investments in working interests in oil and gas properties are doubly blessed: not only is the initial investment largely tax deductible when made but also, the income is tax free to the extent of 27½% through the percentage depletion allowance. There is a popular misconception that investment in these properties is extremely speculative and requires enormous amounts of money. In actuality, investment opportunities in conservative secondary (rather than "wildcat") wells are available and the individual investor can further limit his risk through investing moderate amounts along with other investors in several drilling projects.

To illustrate this, I would like to discuss a drilling project in Texas which I am personally familiar. This is in a gas field where there are known gas reserves and in which many successful wells have been drilled. The gas in this area is close to the surface but because the terrain was not tested originally by the most modern methods, it was only recently that a new technique allowed redrilling of these wells right on top of the known reserves. In a recently drilled three well project there were two good producing wells and one "dry hole" or dud. I think this is a typical result. The investors will recover the cost of their investment in the three wells in less than two years and after that will receive a return of thirty to forty per cent per pear on their original investment for years and years to come. This return is excellent even if there were no tax advantages, but what makes a truly unique investment is:

1. The investors can deduct about 85% of the cost of their investment in the first year and recover the rest by means of one of the accelerated depreciation schedules allowed by the Treasury, and

2. 27½% of every dollar of income is tax-free.

A second attractive deductible investment is "leverage" real estate. This involves buying undeveloped land in growth areas with a very minimal down payment and deferred amortization of the mortgage debt so that the largest part of the investment consists of interest on the mortgage and real estate taxes, both of which are tax deductible. The return on this investment is realized through the sale of the property and is taxed at capital gains rates. One of the prime areas for this type of investment is in San Bernardino County, California, where the population is growing at six and one-half times the national average and where there has been a tremendous expansion in industrial development. The advantages are that:

1. Less than a 15% down payment need be made on the purchase price and no further payment on the mortgage need be made for five years.

2. Under California law, the investor is not individually liable on the mortgage. He can "walk away" from it at any time.

3. The real estate taxes and interest are tax deductible and the latter can be prepaid for as much as five years in advance in order to keep the investor out of high tax brackets in a current year of unusually high earnings.

4. The gain on sale is taxable as a capital gain.

This works out so that, on the average, $3500 of tax deductible investment ends up as $11,000 capital gain. The spread is better than 3-1 since the after tax cost of the $3500 is proportionately less than the after tax capital gain. An investor in the 50% bracket thus converts $1750 after tax dollars into $8250 after tax gains.

Finally, I would like to discuss a way to make deductible investments in the stock market and the type of stocks you should consider. If you use the money in your pension trust to buy stocks, you will have, in effect, made a deductible investment because you receive a deduction for the amount of your contribution to the plan.

The stocks I like best are what are called "salvage stocks." These are stocks in which the quick assets, that is, cash and receivables plus liquidatable inventory exceeds the total amount of all debt plus the price the stock is selling for on the market. The investing group will generally go into these investments only if they have a sufficient element of control over the company to force its liquidation. If the price of the stock goes up they sell and make a gain; if it goes down, they force a liquidation and get a return of their investment plus a profit. That's why they are called "salvage stocks." It's a heads I win, tails you lose proposition and the three or four situations a year that can be found are well worth waiting for. Even if no pension or profit sharing trust is used, the combination of safety and increment make such shares attractive even if bought with after tax dollars.

While not an investment in the conventional sense, I think every physician should consider "investing" in a Medical Research Foundation. Such foundations are tax favored over all other types of privately controlled foundations. They may be controlled by the physicians alone or together with his family or friends. Non-profit research should be carried on to qualify but a large portion of income may be accumulated tax free. Friends or patients as well as the physician can make tax deductible contributions. The founding physician can deduct traveling expenses on research projects.

The physician can carry on qualifying research work during his years of major activity and income and then work increasingly for the foundation as his energies and income wane. Money previously contributed deductibly and accumulated tax free can then be used to pay him a salary, thus providing retirement income. Members of the family with adequate skills may also be employed.

If land or oil and gas properties are used for contributions to the foundation, the doctor gets double deductions. First, he can deduct the interest payments on the land or the drilling expenses on the oil or gas property. Then when the property is contributed, its fair market value (established by appraisal) is tax deductible as a charitable contribution. The double tax saving can easily outweigh the cash outlay.

Contributions of appreciated "salvage stock" before sale also cuts the cost of gifts. Gifts of preferred stock from corporations closely held by relatives or friends give the donors special tax advantages. Bequests to such foundation are free of Estate Tax.

It's time for a little self-diagnosis, Doctor. If you're paying high taxes on your professional income and then investing what is left, after living expenses, you are not doing all you could or should for yourself and your family. You should consider pension and profit sharing plans, minimum deposit insurance, tax deductible investments and a medical research foundation. It's about time you had the Internal Revenue Code working for you instead of against you.

The Council believes that properly instituted diet therapy can significantly and safely alter the serum cholesterol and B-lipoprotein concentrations of most hypercholesteremic human subjects.

The Council recommends that when this diet therapy is carried out it should be under the supervision of the physician with adequate follow-up procedures including laboratory studies.

The Council recognizes the importance of epidemiological studies which have shown an association between low serum-cholesterol values and low mortality rates for arteriolosclerotic heart disease although it believes that a causative relationship has not yet been proved.

The Council supports and encourages investigations of American population groups to test the effect of properly supervised diet therapy as a means of prevention of coronary disease. Finally the Council believes that, despite the promise of the diet in therapy, there is not sufficient information available at the present time to warrant a change in the American diet aimed at preventing heart disease in the general population.

—William J. Darby, M.D., Ph.D., Chairman, Council on Foods and Nutrition, *J.A.M.A.,* 182:1329, December 29, 1962.

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Through its continued official sponsorship of our Group Plans, The Connecticut State Medical Society has once again made it possible to offer broadened coverage under these two time-tested policies to members of the Society. If you are not now enrolled, do not turn your back on old friends who have served Connecticut physicians for over a quarter of a century. If a sufficient number of new applications are submitted for the Major Medical Expense Plan, all policies will be issued regardless of past medical history. For full information write or phone.

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RORER WILLIAM H. RORER, INC., FORT WASHINGTON, PA.

Clinical Medicine

Committee On Maternal Mortality And Morbidity

Uterine Inversion

Summary

The patient was an 18-year-old white primigravida admitted at term in early labor.

Prenatal History

The patient made only two prenatal visits to her physician. Laboratory reports revealed a negative serology, blood type A, Rh negative, and a "mild" anemia.

Course In Hospital

Physicial examination on admission at term revealed essentially normal findings and a blood pressure of 120/70. Labor progressed satisfactorily, lasting a total of 9 hours and 5 minutes, of which 8 hours and 15 minutes constituted the first stage, 20 minutes the second stage, and 30 minutes the third stage. A six-pound, ten-ounce living child was delivered by elective low forceps under general anesthesia. Ergotrate was given intravenously after delivery of the infant, and pitocin was given intramuscularly after the intact placenta was manually expressed. The cervix and vagina were inspected and found to be free of lacerations. The blood loss was estimated as moderate in amount, and a vaginal pack was inserted. On transfer from the delivery room her blood pressure was 120/80 and the pulse 80.

One hour later, the blood pressure was 80/40, and the pulse 120. The patient was in shock by the second postpartum hour, with labored respiration, faint pulse, and an unobtainable blood pressure. There was moderate bleeding through the vaginal packing. The hematocrit at this time was 26 per cent, and the clotting time was normal. Intravenous fluids and blood were started, and the blood pressure was recorded in ranges from 80/40 to 60/0. Eight hours after delivery, an obstetrical consultant was called. At this time the patient was semiconscious, the deep reflexes were absent, the uterus well contracted, the skin extremely pale and cool, blood pressure not obtainable, the pulse weak, and the heart rate 180. The consultant's diagnosis was shock, etiology obscure, and the prognosis guarded. It was considered that hemorrhage or possibly adrenal-cortical failure accounted for the patient's condition. Recommendations made by the consultant were rapid blood replacement, cortisone, 25 mgms, every four hours, Levophed titration of blood pressure back to normal range, and observation of urinary output. A second obstetrical consultant saw the patient two hours later. After she had received two additional pints of blood the patient's condition improved, with the blood pressure being recorded at 85/50, and the pulse of good quality although rapid. Oozing was observed through the vaginal packing, and the uterus was firm and well up in the abdomen. Because of the apparent improvement, further examination or interference was felt unwise, and the prognosis was considered good.

Approximately three and one-half hours later the same consultant was called again. At this time the patient's condition was deteriorating, despite the administration of a total of four pints of blood and the continued use of intravenous Levophed. Three hours later, approximately sixteen hours after delivery, a vaginal examination was performed with removal of the vaginal packing, and a uterine inversion was found. The fundus and upper corpus were in the vagina with a very tight cervical constriction admitting only a finger between the cervix and inverted corpus. During reposition and packing of the uterus the patient gasped and died.

Relevant Autopsy Findings

A funnel-shaped depression marks the stite of the fundus of the gravid uterus, which has been inverted in the large, sac-shaped uterine cavity. The inversion is complete, and there is a constricting cervical ring from which the incarcerated fundus is released with some difficulty. Within the funnel-shaped depression, the serosal surfaces are in apposition with each other, and the fallopian tubes as well as portions of the broad ligament and the ovaries are drawn down into the tract.

One of the striking findings at the autopsy is the markedly reduced amount of blood. Only a few ounces fill the pleural cavities on removal of the chest organs.

Provisional Anatomic Diagnosis

Acute complex inversion of puerperal uterus, exsanguination, clinical shock.

Discussion

Although uterine inversion is not a common cause of postpartum hemorrhage and shock, it, as well as all but the most obvious causes, will never be diagnosed unless a proper examination is performed. Excessive bleeding following the delivery of the infant and placenta was obviously noted by the physician in attendance, since both the cervix and vagina were inspected and a vaginal pack inserted. The cause of the bleeding was not ascertained. The empiric use of a vaginal pack is always to be condemned. The inadequate prenatal care and knowledge of an antepartum anemia should have stimulated careful evaluation of the patient on admission. A patient's ability to withstand blood loss, and all obstetrical patients bleed, is to a considerable degree in proportion to her initial blood picture. Although no mention is made of difficulty in the expression of the placenta, the 30-minute third stage suggests that the placenta failed to separate promptly or possibly was trapped by the use of ergotrate. Undue fundal pressure or cord traction could have been related to the uterine inversion. Two hours following delivery, the patient was noted to be in shock. Surely by this time investigation of the hemoglobin and/or hematocrit, with adequate blood replacement should have been accomplished, and obstetrical consultation should have been obtained.

Low values for the hematocrit signify the existence of compensated anemia or hydremia. In this instance the hematocrit of 26 per cent found 2 hours following delivery is strong, if not conclusive, evidence that marked anemia of the compensated variety was present prior to labor and the onset of complications. Provided patients are in a state of fluid and electrolyte balance the presence of anemia or loss of blood due to hemorrhage initiates an influx of fluid from the tissues into the vascular bed to compensate for existing deficits. By increasing the volume of plasma the process of hemodilution restores total blood volume to normal. In the absence of transfusion therapy following hemorrhage, hemodilution can replenish sizeable deficits within 24 to 48 hours. The resulting, excessive volume of plasma restores total blood volume to normal but the qualitative deficit of the red blood cell volume persists. This acounts for the low value for the hematocrit and the inadequate oxygenation of all tissue. Implications and the importance of hypoxia are too frequently overlooked. Correction of such qualititative deficits characteristic of compensated anemia demands the administration of judicious amounts of packed red blood cells. Injudicious use of whole blood to patients with low values of the hematocrit who are not bleeding may precipitate onset of pulmonary edema due to circulatory overload. Administration of 2-3 units of packed red blood cells may well have been indicated prior to the delivery of this patient. Had they been administered the severity of the shock would have been lessened.

Because the total volume of circulating blood is normal in the presence of compensated anemia, the compensatory mechanisms of vasoconstriction increased rate and force of myocardial contractions and inreased cardiac output can maintain blood pressure. Additional losses of but small amounts of blood exaggerates existing inadequacy of oxygenation and readily precipitates onset of shock. This patient's ability to tolerate hemorrhage was severely compromised by her existing anemia.

Normal patients tolerate losses up to 25-30 per cent of blood volume without the onset of shock. Patients with existing anemia who hemorrhage may slip into shock with the loss of but 5-15 per cent of their circulating blood volume.

It was six hours later before consultation was deemed necessary. Levophed or cortisone are not substitutes for adequate blood replacement.

Reduction of cardiac output and hypotension caused by hemorrhage initiates the onset of marked vasoconstriction of renal vessels. Levarterenol and other potent vasoconstrictors accentuate the renal effects of hemorrhage and may contribute to the onset of lower nephron nephrosis. Although milder acting vasoconstrictors may serve a temporary beneficial effect, the most effective treatment of hemorrhagic shock is transfusions of blood.

Why the consultant failed to remain with the patient to observe her response to blood replacement and then to perform a vaginal examination is not understood. To render a diagnosis of "shock, etiology obscure," and leave the patient, is to be deplored. Another consultant called two hours later observed clinical improvement; yet even he failed to examine the patient. It was only when the patient was *in extremis* that the packing was removed and a pelvic examination performed.

Simple acts such as moving a patient, or changing her position, can precipitate demise when patients are in shock. Initiation of untoward reflex activity as occurred with the trauma fo attempting to replace this patient's inverted uterus produces the same hazard. The protective action of the carotid sinus reflex and other vascular reflexes prove of no value because the compensatory reserve has already been exhausted. The secretion of adrenaline and/or nor-adrenaline has caused vasoconstriction, increased rate and force of myocardial contractoins, increased cardiac output and elevation of blood pressure. Initiation of untoward reflex activity when compensatory reserve has been exhausted readily drops blood pressure to levels incompatible with life or causes onset of ventricular fibrillation or cardica standstill.

The diagnosis of an inverted uterus can be made with certainty only by pelvic examination. If the fundus of the uterus is well supported above the symphysis pubis by one of the obstetrician's hands during extraction of the placenta, it is almost impossible for the uterus to become inverted. Manual exploration of the uterus, performed routinely by many obstetricians, is not only a safeguard against retained secundines, but also a means to rule out inversion. Blood replacement in shock is not enough. Efforts to make a diagnosis as to the etiology of the shock are paramount. Careful exploration of the whole birth canal is mandatory. The presence of hypovolemia can be recognized and appreciated only by clinical observation and serial blood studies. Proper diagnosis and aggressive therapy would have surely saved the life of this patient.

MARK YOUR CALENDAR

THIRTY-EIGHTH CONNECTICUT CLINICAL CONGRESS

of the

CONNECTICUT STATE MEDICAL SOCIETY

and the

YALE UNIVERSITY SCHOOL OF MEDICINE

YALE - NEW HAVEN MEDICAL CENTER
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SEPTEMBER 27, 1963

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Doctor's Office

Alfred L. Babcock, M.D., announces the opening of an office for the practice of plastic and reconstructive surgery at 85 Jefferson Street, Hartford.

Victor L. Fortin, Jr., M.D., announces the opening of an office in association with Salvatore R. Carrabba, M.D., for the practice of obstetrics and gynecology at 140 Woodland Street, Hartford.

Hugh Friend, M.D., announces the opening of an office in association with W. H. Lowell, Jr., M.D., William F. Prestley, M.D., and Robert Walker, M.D., for the practice of internal medicine at 85 Jefferson Street, Hartford

Eugene Kalman, M.D., announces the removal of his office from 2255 Burr Street to 4267 Black Rock Turnpike, Fairfield.

James T. Keegan, M.D., announces the opening of an office in association with Gioacchino S. Parrella, M.D., for the practice of general surgery at 2044 Bridgeport Avenue, Milford.

Arthur B. Landry, Jr., M.D., announces the opening of an office in association with Arthur B. Landry, Sr., M.D., for the practice of internal medicine and cardiology at 50 Farmington Avenue, Hartford.

George A. Patterson, M.D., announces the opening of an office for the practice of obstetrics and gynecology at 6 Maple Street, Norwalk.

Sidney Perlman, M.D., announces the opening of an office in association with Robert H. Karotkin, M.D., and William H. Glass, M.D., for the practice of internal medicine at 59 Gillett Street, Hartford.

Blake D. Prescott, M.D., announces the opening of an office for the general practice of medicine at Storrs Road, Storrs.

Josefina Rodriguez, M.D., announces the opening of an office for the practice of internal medicine at 54 Pratt Street, Hartford.

Bernard S. Siegel, M.D., announces the opening of an office in association with Richard A. Selzer, M.D., for the practice of surgery of infants, children, and general surgery at 100 Whitney Avenue, New Haven.

John F. Summa, M.D., announces the opening of an office in association with Jasper A. Smith, M.D., for the practice of cardiovascular diseases at 77 Central Avenue, Waterbury.

Ciro Veneruso, M.D., announces the opening of an office for the practice of psychiatry at 935 White Plains Road, Trumbull.

E. Maurice Wakeman, M.D., announces the opening of an office in association with Alan Mermann, M.D., and Peter Cunningham, M.D., for the practice of pediatrics at 152 Broad Street, Guilford.

Gerald S. Yudkin, M.D., announces the opening of an office for the practice of psychiatry, specializing with children and adolescents, at 257 Church Street, New Haven.

PLACEMENT WANTED

The Society's Placement Service is in receipt of the following:

Specialty surgery. Waclaw Hojnoski, M.D., Age 33, M.D. Boston University.

Specialty surgery. Timoleon D. Deliyannis, M.D., Age 40, M.D. National University of Athens School of Medicine 1947.

PLACEMENT OPPORTUNITIES

Fairfield County. Well established general practice to lease or buy.

Fairfield County. General practice for sale.

Litchfield County. General Practice including obstetrics, vacancy left by busy practitioner.

Pediatricians part time temporary for State Crippled Clinics Norwich and Windham monthly and Hartford Office two to four days per month.

ANYONE INTERESTED IN THE ABOVE IS ASKED TO COMMUNICATE WITH THE GENERAL MANAGER'S OFFICE, 160 ST. RONAN STREET, NEW HAVEN.

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In Memoriam

Donnelly, W. Allen—West Hartford; University of Vermont, College of Medicine, 1934. During World War II, he served for three years in China as a lieutenant commander in the Navy. Dr. Donnelly was an ear, nose, and throat specialist. He served on the surgical staff of St. Francis Hospital as an attending otorhinolaryngologist. Dr. Donnelly was a member of the Hartford County Medical Association, the Connecticut State Medical Society, the American Medical Association, the American Triological Society and the American Board of Otolaryngology. Dr. Donnelly died August 7, at the age of 54.

Finklestone, Benjamin B.—Bridgeport; Baltimore Physicians and Surgeons College, 1910. Dr. Finklestone had resided in Bridgeport for 70 years. He served as a Lieutenant in the Army, during World War I. He was a member of the Bridgeport Medical Society, the Fairfield County Medical Association, the Connecticut State Medical Society, and the American Medical Association. Dr. Finklestone died August 6, at the age of 76.

Henze, Carl W.—Hamden; Yale School of Medicine, 1900. Dr. Henze served as clinical instructor in medicine at the Yale Medical School from 1903 to 1906, and then went to Europe to study at the University of Bern in Switzerland. He studied orthopedic surgery at Harvard Medical School until 1911 when he again went to Europe as assistant to Dr. Fritz Lange, eminent surgeon. He returned to this country just before World War I started, and from 1913 to 1915 was assistant in the clinic of the former Hospital for the Ruptured and Crippled in New York City. He returned to New Haven in 1915 and started a private practice, but found time to serve as attending orthopedic surgeon at St. Vincent's Hospital in Bridgeport, Charlotte Hungerford Hospital in Torrington, Griffin Hospital in Derby, and the Grace-New Haven Community Hospital. The Crippled Children's Aid Society of New Haven was founded in 1915 and from that time until 1942, Dr. Henze served as orthopedic surgeon for the society. A former president of the New Haven Medical Society, he was also a member of the American Medical Association and the Connecticut State Medical Society. He delivered many papers at medical conventions and in 1914 was the first to present a paper on the experimental study of silk-tendon plastics with particular reference to post-operative adhesions. Dr. Henze died July 23, at the age of 85.

Lambert, H. Bertram—Southport; Jefferson Medical College, 1909. Dr. Lambert practiced medicine in Bridgeport for 35 years. Dr. Lambert once served as physician to President Woodrow Wilson and was senior medical officer on the liner George Washington when Wilson and his wife sailed to France for the Versailles Conference after World War I. He also was surgeon in charge when the late Franklin D. Roosevelt crossed the Atlantic some years prior to election to the White House. He was senior surgeon at Bridgeport Hospital for many years and also in charge of surgery at the State Veteran's Hospital in Rocky Hill. Dr. Lambert was a member of the Fairfield County Medical Association, the Connecticut State Medical Society, the American Medical Association, the American College of Surgeons, the New England Society of Surgeons, and the University Club. He was past president of the Bridgeport Medical Society. He was the last surviving charter member of the Pequot Yacht Club. Dr. Lambert died July 14, at the age 79.

Around The State

New Haven County

Dr. R. M. Fasanella acted as co-ordinator and speaker at a conference arranged by Dr. Jorn Boberg-Ans which was held in Charlottenlund, Denmark from September 1st to the 7th, 1963. Some of the topics discussed were: complications of corneal grafting; complications of cataract and glaucoma; retinal detachment.

Dr. Byron H. Waksman, a leading authority on antibody response and immunity, has been appointed Professor of Microbiology at the Yale School of Medicine.

He is currently an Associate Bacteriologist in the Neurology Service at Massachusetts General Hospital in Boston. He also is a Consulting Associate Bacteriologist at the Massachusetts Eye and Ear Infirmary, and a member of the faculty of the Department of Bacteriology and Immunology at Harvard University Medical School.

According to Professor Edward A. Adelberg, Chairman of the Department of Microbiology, Dr. Waksman's research is applicable to many areas of medicine, and will strengthen the resources of the entire Medical School program.

The newly-appointed Yale professor is widely-known for his work on hypersensitivity and the role of the thymus gland in the origin of antibody-forming cells.

Special Notices

HARTFORD HOSPITAL
SATURDAY MORNING 11 O'CLOCK GUEST SPEAKERS
October 4 to December 28, 1963

October 4-5 (2-Day Visiting Internist) — N. Edward Rossett, M.D., Assoc. Prof. of Medicine, Univ. of Tennessee, Memphis, Tenn.
October 4 — "The Management of Peptic Ulceration."
October 5 — 11:00 a.m., H.H. Amphitheater. Subject: "Gastroscopy" (Fiberoptics).

October 10-12 (3-Day Visiting Surgeon) — Ben Eiseman, M.D., Prof. of Surgery, Univ. of Kentucky, Lexington, Kentucky.
October 10 — Operating and Rounds with Resident Staff.
October 11 — Surgical Path. and Surgical X-Ray Conferences.
October 12 — H.H. Amphitheater. 9:00 a.m. "Visceral Transplants." 11:00 a.m. "The Management of Staph. Enteritis."
October 12 — 10:00 a.m. Grand Rounds.

October 19 — Lester Adelson, M.D., Coroner, Cyahoga County; Assoc. Prof. of Pathology, Western Reserve, Cleveland. Subject: "Suicide or Homicide?"

October 25-26 — American College of Physicians — Regional Meeting. Statler-Hilton Hotel, Hartford.

November 2 — William S. Howland, M.D., Chief of Anaesthesiology, Memorial Hospital, New York City. Subject: "Shock—Medical and Surgical Triumphs" ("Man vs. Environment").

November 9 — Paul Calabrese, M.D., Assoc. Prof. of Medicine, Yale. Subject: "Anti-Neoplastic Agents Useful in Non-Neoplastic Disease."

November 15-16 — Ralph Thiers, Ph.D., Director, Clinical Chemistry, Duke Univ., Durham, North Carolina.
November 15 — 12:00 Noon — H.H. Amphitheater. Subject: "Simple, Useful Laboratory Tests."
November 16 — 11:00 a.m. — H.H. Amphitheater. Subject: "The Impact in the Clinic of Multiple Analyses in the Laboratory."

November 22-23 — (2-Day Visiting Ob-Gyn). Leon Israel, M.D., Clinical Prof. of Ob-Gyn, Univ. of Penn.
November 22 — Conference and Grand Rounds.
November 23 — H.H. Amphitheater. 10:00 a.m. "Recent Endocrinological Advancements." 11:00 a.m. "Medicine — Surgery and Obstetrics."

November 30 — Robert S. Morrison, M.D., Lemuel Shattuck Hospital, Boston. Subject: "Endocrine Control of Renal Function."

December 7 — Surgical Research Forum — 9:00 a.m. — 3:00 p.m. Edward Howes, M.D. *et al.*

December 12-14 (3-Day Visiting Surgeon) — Ralph A. Deterling, M.D., Prof. of Surgery, Tufts.
December 12 — Operating and Rounds with Resident Staff.
December 13 — Surgical Path. and Surgical X-Ray Conferences.
December 14 — H.H. Amphitheater. 9:00 a.m. "Problems of the Jaundiced Patient." 11:00 a.m. "Recent Advances in Cardiovascular Surgery."

YALE UNIVERSITY SCHOOL OF MEDICINE and the CRIPPLED CHILDREN'S SOCIETY
October 9, 1963

Yale University School of Medicine and the Crippled Children's Society will present A Special Postgraduate Program for Practicing Physicians "Common Problems of Crippled Children—Diagnosis and Treatment" on Wednesday, October 9, 1963, 2:00 to 5:00 P.M. Farnam Auditorium at the Yale New Haven Medical Center.

There is no registration fee or tuition. All interested physicians are invited to attend.

NEW ENGLAND POSTGRADUATE ASSEMBLY
Statler Hilton, Boston, Massachusetts
November 13, 14, 15, 1963

The three-day program will feature symposia, panels, gem lectures, luncheon talks and CPC's. The program has been arranged so as to appeal to all MDs, both specialists and family physicians. Speakers will be nationally recognized authorities noted for their lucid presentations.

The preliminary program was published in CONNECTICUT MEDICINE in July on pages 419 and 421, and will again appear in our October issue.

FIFTH NATIONAL CANCER CONFERENCE
September 17, 18, and 19, 1964

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FIRST ANNUAL POSTGRADUATE SEMINAR IN ANESTHESIOLOGY
The University of Miami and University of Florida Schools of Medicine
Miami Beach, Florida
January 5-8, 1964

The theme for the seminar is "THE CARDIOVASCULAR SYSTEM" and although the problems of this system in relation to anesthesia will be stressed, the subjects presented are of vital interest to all phases of medical practice. The program will consist of five panel discussions; (1) Physiological considerations in circulation, (2) Recent advances in management of cardiac arrest, (3) Pharmacological considerations related to circulation, (4) Surgical and anesthetic management of the patient with heart disease, (5) Symposium on hemorrhagic and septic shock.

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Of the total fatty acid content, 28% is *cis-cis linoleic acid.*

Moreover, when you recommend Mrs. Filbert's Corn Oil Margarine, your patient is assured of receiving unmatched taste and flavor satisfaction —an important consideration in promoting adherence to any therapeutic regimen.

*AMA Council on Foods and Nutrition: The Regulation of Dietary Fat, *JAMA* 181:411-423 (August 4, 1962).

**AMA Council on Foods and Nutrition: Composition of Certain Margarines, *JAMA* 179:719 (March 3, 1962).

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Plea Made For Active Tetanus Immunization

Routine active immunization against tetanus was recommended for all persons recently in an article in the current Journal of the American Medical Association.

Tetanus, also called lockjaw, is an infectious disease, often fatal, which is caused by a germ which invades the body primarily through wounds. The germ produces a poison, or toxin, which causes muscle spasms, particularly those of the neck and lower jaw.

Active immunization consists of a series of injections of a toxoid containing modified toxin which stimulates the body's production of antibodies to counteract the toxin. Lacking this immunization, the disease may be prevented by injecting an antitoxin derived from equine blood serum which contains the antibodies themselves (passive immunization) as soon as possible after an injury occurs.

Reactions to active immunization are rare, but reactions to passive immunization are much more frequent and can be severe. Dr. H. William Bardenwerper, Milwaukee, Wisc., warned in the Journal.

Sickness results in an estimated 15 to 30 per cent of the persons receiving the more than two million doses of antitoxin administered yearly, he said. Death is reported to occur in one out of every 100,000 persons given the antitoxin, he said.

The sickness, termed serum neuritis, usually causes intense pain involving the muscles and paralysis of varying degree, he said. Recovery can require anywhere from six months to two years and permanent muscular weakness results in about 20 per cent, he said.

Another disadvantage of the antitoxin is its reduced efficiency on succeeding administration, he said.

Most communities now have established programs for the active immunization of infants and school children against tetanus, the author said. However, he said, there is no program for providing subsequent booster injections for these children or for immunized veterans of World War II and the Korean conflict and no program has been provided for older children and adults.

The efficiency and safety of active immunization "urgently recommend" a concentrated campaign to protect all persons from tetanus in this way, he said.

Mass disasters requiring mass protection against tetanus "must be considered as an increasing possibility."

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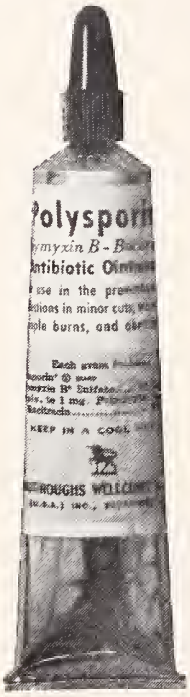

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NEW BOOKS IN REVIEW

"CLINICAL METABOLISM OF BODY WATER AND ELECTROLYTES;" Bland, J. H., W. B. Saunders Company, Philadelphia and London, 1963. pp. 623. 339 illustrations, $16.50.

Reviewed by: ROY N. BARNETT

This is an extremely comprehensive work covering much more material than is implicit in the title. There are twenty-two chapters, five by Dr. Bland, the others by twenty-one collaborators. The first eight chapters are devoted to body chemistry and physiology, the rest to disturbances in specific organ systems, pathologic conditions and age groups.

This book is primarily a reference work. The important clinical and experimental literature in each field is critically reviewed up to the date of writing. Certain topics which are of particular current interest are discussed very adequately; these include the artificial kidney, its indications, use and team organization; peritoneal dialysis, and bacteremic shock.

Because of the neat organization of each chapter under subheads it is possible to look up specific practical points without reading the literature and general considerations. There are very practical and useful discussions of such matters as recognizing and treating different types of shock, rehydrating infants with diarrhea, and handling all aspects of diabetes. These discussions are not confined to water and salt but also cover other important treatment modalities.

This volume is not for light reading. The material is difficult, requires some mathematical thinking, and is unfamiliar to many older practitioners. The style of writing is often pedestrian and sometimes opaque. A few charts (i.e. 11-1 and 11-2) are incomprehensible because of inadequate identification of the symbols used.

On the other hand anyone who studies the material in his own field of interest with care will find the most up-to-date and useful information.

I recommend this book highly to any physician who would like to familiarize himself with any aspects of fluids, electrolytes and related topics.

MEDICAL CARE OF THE ATHLETE. A Comprehensive Guide for Physicians, Coaches and Trainers by Allan J. Ryan, M.D. McGraw-Hill, 1962, 327 pp., $9.75.

Reviewed by: MALCOLM S. BEINFIELD

In recent years there has been a burgeoning interest in prevention and management of athletic injuries. Allan J. Ryan of Meriden, former chairman of the American Medical Association Committee on the medical aspect of sports and past president of the American College of Sports Medicine, has written a very useful book entitled *Medical Care of the Athlete.*

This book is divided into nine chapters. The first four chapters pertain to the interrelationship between the physician, coach, trainer and athlete. Dr. Ryan clearly delineates the responsibilities of the team physician in the field of organized athletics. The pre-season physical examination is detailed with emphasis placed on those medical conditions which preclude participation in contact sports. There is a very practical chapter relating to the role of the physician in the training of the athlete. Emphasis is placed on the gradual increment of conditioning exercises and the important role that proper conditioning plays in the prevention of injury. Diet is discussed, and it is pointed out that a well balanced diet is recommended for the athlete, as it is for every one else. The use of dietary fads is decried, as is the indiscriminate use of vitamins and supplements. The use and abuse of taping is discussed, and it is emphasized that the ankle joint may often be protected by properly applied taping, but that the integrity of the knee joint requires a powerful quadriceps mechanism and that taping the knee is not only ineffectual but does not permit adequate mobility.

Chapters V and VI outline common sports injuries, their diagnosis and management. The choice of approved procedures is clearly indicated, but details of their performance is not considered. The reader is referred to standard surgical texts for these details. Under the heading of injuries to the brain and its covering, a discussion of concussion, contusion and lacerations is presented. An admonition that falling blood pressure and a rising pulse are indicative of a "danger sign" is questioned by the reviewer, who could regard the unconscious patient with a rising blood pressure and a falling pulse with even greater concern. More aggressive management of closed injuries of the knee and ankle is stressed. It is emphasized that the only choice of therapy in the severe joint sprain must be early surgery. The failure to recognize the advantages of early surgical repair has led to the legacy of "chronic knees" and "ankles" to the colleges by secondary schools.

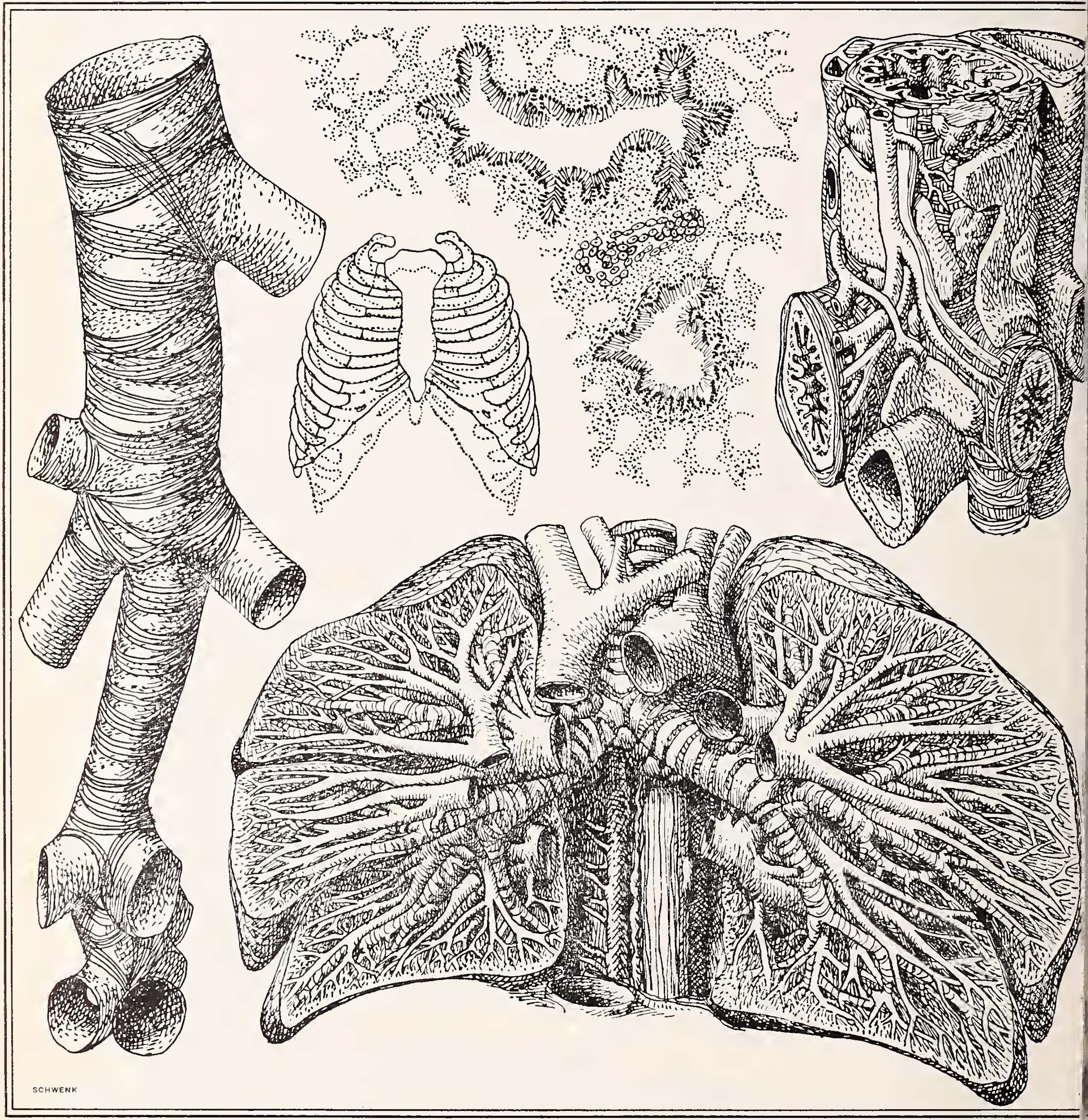
The final chapters outline the non-traumatic medical problems of athletes and the re-conditioning and rehabilitation of the injured athletes. In contrast to several other recent publications in this field, there is a paucity of illustration.

This volume is recommended to all those physicians who assume the responsibility of caring for the scholastic and collegiate athlete. Moreover, it should be mandatory reading for all coaches and trainers, as it so thoroughly deals with their role in the care of the athlete and the benefits of a team effort by the coach and physician. It is a timely book, well organized, down to earth and not pedantic.

PROTEIN METABOLISM: Influence of growth hormone, anabolic steroids, and nutrition in health and disease, An International Symposium, Springer-Verlag. Berlin, Gottingen, Heidelberg, 1962, 505 pp.

Reviewed by: LEONARD MAIDMAN

Held in Leyden, Holland, in June, 1962, this symposium was the fourth since 1959 in a series sponsored by Ciba Ltd., Basel. The previous subjects were "Diuresis and Diuretics," "Essential Hypertension," and "Shock, Pathogenesis and Therapy." The chairman was Professor A. Queredo of the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References: (1) Moyer, J. H., and Heider, C.: Am. J. Cardiol. *9*:920 (June) 1962. (2) Brest, A. N., and Moyer, J. H.: Pennsylvania M. J. *63*:545 (Apr.) 1960. (3) Berry, R. L., and Bray, H. P.: J. Am. Geriatrics Soc. *10*:516 (June) 1962. (4) Hutchison, J. C.: Current Therap. Res. *4*:610 (Dec.) 1962. (5) Feldman, L. H.: North Carolina M. J.: *23*:248 (June) 1962.

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Department of Endocrinology, University Hospital, Leyden. The editor of the volume is Dr. F. Gross, Director of Laboratories, Ciba. Participating were forty investigators, both clinical and laboratory, from Europe, England, United States, South Africa, Canada, Israel and India, contributing twenty-nine original papers and thirty-two spirited discussions.

The subjects vary from basic scientific studies, e.g., "The importance of experimental conditions for the demonstration of hormone effects *in vitro* and *in vivo*" to very topical clinical notes, such as "Anabolic steroids in the treatment of renal failure." The large subdivisions of topics are: "Action of hormones at a cellular level," "Factors influencing protein metabolism in the organism," "Evaluation and mode of action of the anabolic steroids," "Protein metabolism in human pathological states," and "The effects of anabolic agents in man."

The purpose of the symposium was "to assemble together a number of experienced workers in the field of protein metabolism, in order to discuss biological mechanisms and conditions related to protein metabolism at the cellular level and in the organism in a state of health, in a state of disease, and in a state of repair." This purpose is very well achieved in the discussions that follow each paper, as well as the papers themselves. Unfortunately, however, the very same attributes of accomplishment and ability that give the symposium its special value also restrict severely its potential popular interest. The volume is of far greater interest to the experimental endocrinologist and investigator of metabolism than to the practitioner of medicine. This is inevitable in any discussion at a basic science level; the few clinical papers yield no startling conclusions.

Ciba, Ltd., is to be congratulated for avoiding any commercial temptation to promote its anabolic steroid preparations. The company name is mentioned only on the title page and preface.

Therefore, in summary, the volume offers a selected series of papers on Protein Metabolism that reflect the current interests of research workers in that field and their interactions in the reported discussions. Since it cannot survey the whole field in a connected fashion, since so much of this knowledge is in a state of flux involving the assimilation of the most recent cellular biochemical advances, and since so little can be applied clinically at this time, this volume is of value only for special and limited reference. It is recommended as a thoughtful collection of stimulating reports in a field that has recently reawakened. For those who are unaware of recent endocrinological developments, it provides a guide to the latest paths of research and a prediction of future achievements.

RESULTS OF SURGERY FOR PEPTIC ULCER (A Cooperative Study by Twelve Veterans Administration Hospitals), edited by B. W. Postlethwait, M.D., Associate Editor: James C. Thoroughman, M.D., with a Foreword by Lester R. Dragstedt, M.D., Philadelphia, London, W. B. Saunders Company, May 29, 1963, 308 pp., $8.00.

Reviewed by: IRA S. GOLDENBERG

So frequently the commonest of man's afflictions are the ones most confusing to the physician when etiology and therapy are evaluated. Peptic ulcer, which according to reliable surveys has an occurrence rate in the United States of approximately 21 cases per 1,000 persons, is such a disease. The etiological factors remain obscure despite numerous attempts to define them in detail, and therapeutic endeavor is far from curative. Because the ulcer problem is so common, many thousands of patients present themselves annually to physicians with disabling symptomatology and even life-threatening complications, and each patient must somehow be treated.

Non-operative medical management probably serves to control the disease in the majority of patients, but surgical therapy must often be invoked. How effective is operative management of peptic ulcer? This book attempts to examine the problem and, although it does not provide answers to all questions about the disease, it reveals many facets of interest by retrospective analysis of case records of almost 3,000 patients. These patients were all treated surgically at various Veterans Administration hospitals over an eleven-year period and the reasons for operation, choice of operation, complications of operation, the ultimate results, etc., have all been noted carefully.

There has never been such a tremendous compilation of data about management of peptic ulcer as has been accomplished here and anyone interested in this disease is urged to consult this report for a wealth of information. The authors are cognizant of the limitations of this type of retrospective study involving many hospitals and they emphasize the fact that a prospective cooperative study is now in progress in 19 Veterans Administration hospitals to evaluate four major operations for the treatment of duodenal ulcer: 1) gastric resection; 2) vagotomy and drainage; 3) vagotomy and hemigastrectomy; and 4) vagotomy and twenty to thirty per cent gastric resection. The ultimate companion report to the present study should be extremely valuable and possibly may answer once and for all the question—which operation is the best one for peptic ulcer disease?

CORRELATIVE NEUROANATOMY AND FUNCTIONAL NEUROLOGY by Joseph G. Chusid, M.D. and Joseph J. McDonald, M.D., Lange Medical Publications, Los Altos, California, 1962, 384 pp. $5.50.

Reviewed by: LOUIS H. NAHUM

This volume is for the beginner in neurology and will aid him but is not a substitute for standard neurologic texts and literature. It should also be an excellent review for practitioners, residents, and graduate physicians who are preparing for specialty board examinations.

The book presents simply and clearly some of the structural and functional features of the nervous system so that the problems encountered in clinical neurology become more intelligible. The charts, diagrams and photographs certainly were prepared primarily with the above purpose in mind. Recent important advances in neurology are well treated and the section on clinical neurology has been extensively revised and amplified in this edition.

There are four sections: one on the central nervous system, and one on the peripheral nerves and autonomic system. Section III deals with principles of neurodiagnosis and Section IV with central nervous system disorders. An appendix contains details of the neurologic examination, visual field charts, average development chart and rehabilitation charts.

There then follows an index and selected reference textbooks.

This is an important handbook from which any physician would benefit if he cared to improve his understanding of clinical neurology.

ELECTROCARDIOGRAPHY: Fundamentals and Clinical Application by Louis Wolff, M.D., 3rd Edition, W. B. Saunders Company, Philadelphia, Pennsylvania, 1962 351 pp. $8.50.

Reviewed by: LOUIS H. NAHUM

This book is divided into three parts. Part One of Seventeen Chapters is devoted to basic principles of electrocardiography. Here we have the conventional use of the dipole basis of the propagation of an impulse in a single cell applied to the complex geometry of the heart. A simple dipole function is assumed to exist in the heart and on the body surface, although it is well established that the field function on the body surface is distorted, far from symmetrical and not that of a dipole. Because of this, the central terminal of the V leads cannot be and are not at zero potential. Although it is unequivocally stated to be so. It is probably true that for teaching purposes the vector concept is a useful one, but if it is, then the vector of the initial .04 sec of the QRS and the final .04 sec assumes meaning as was so beautifully developed by Grant, but is not developed in this book.

The second part devoted to clinical electrocardiography consists of nine chapters and is well done, covering most of the abnormalities that are usually encountered. There is no discussion of diaphragmatic infarction or peri-infarction block and there is no mention of parietal block. A student of electrocardiography would like a clear analysis of the so-called "non-specific." T wave changes, also a clearer definition of the "borderline electrocardiogram." This reviewer would have liked to see a diagram of the common areas of infarction that can be diagnosed electrocardiographically. In such a one, the antero-diaphragmatic area would be clarified. Figure 119 which is said to be both anterior and posterior myocardial infarction, this reviewer would have called antero-diaphragmatic. In the absence of treatment of the pattern diaphragmatic infarction it is not to be expected, that the author would try to differentiate such infarction from a posterior lesion. With so much being written about the P wave and its interpretation, a book on electrocardiography is bound to suffer if the P wave is neglected in electrocardiography.

Part III dealing with the normal and abnormal cardiac mechanism is very well done coming as it does from the pen of the discoverer of the Wolff-Parkinson-White syndrome. It is all descriptive and within this framework it is good for the routine electrocardiographer. The role of hormones such as acetyl choline and epinephrin in the genesis of the abnormal tachycardias is not considered and a conceptual framework for understanding the origin of these rhythms would have helped to explain them better to the student.

At the end of the book is a fine index excellently printed. No bibliography is offered, so that the student who wishes to read further, or confirm the statements made dogmatically, would have to look to another book on the subject. All in all, this is a good routine book on electrocardiography, for students and those clinicians who wish an introduction to electrocardiography, but do not intend to become an experienced electrocardiographer.

PERIPHERAL VASCULAR DISEASES by Edgar V. Allen, M.D. and Nelson W. Barker, M.D. and Edgar A. Hines, Jr., M.D., W. B. Saunders Company, Philadelphia, Pennsylvania, 1962, 367 pp. $18.00.

Reviewed by: LOUIS H. NAHUM

This book is based largely on the experiences of the authors and twenty-two of their associates at the Mayo Clinic. The number of authors is not surprising when one considers the great activity in the study of peripheral vascular disease that has taken place in the present generation. The field has expanded rapidly so that it is now too extensive to permit adequate presentation by a single physician or surgeon. There are forty-three chapters each followed by an extensive bibliography with an excellent index at the end.

To the physician who must care for patients with vascular diseases this book offers practical advice in examination, diagnosis and treatment whether medical or surgical including techniques as well as post-operative practices. To the student, the book provides information on historical development, physiology, pathology and methods of examination and investigation.

Broadly speaking, peripheral vascular disease is a term which should include diseases of all vessels distal to the heart. The lymph channels are certainly vessels and are included. Cerebral arterial diseases are included. So also is surgical treatment of extracranial cerebral arterial occlusion. Hypertension is a peripheral vascular disease but is not included. Renal artery stenosis is also in a broad sense a peripheral vascular disease, which is also not included.

There are sections on modern concepts of blood coagulation and thrombosis, fibrinolysis and the physiology of the circulation. The modern status of angiography is excellently done, so is the consideration of visceral aneurysms. Since anticoagulation is employed extensively in treating thrombosis it would have been well to emphasize the hypercoagulable state that occurs during induction of anticoagulation and also during withdrawal of the coumadin drugs.

The book gives a comprehensive consideration of vascular disease and can be considered a reference book for all who deal in this area of medicine be they student, practitioner, or accomplished surgeon.

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CONNECTICUT
MEDICINE / editorials

An Interprofessional Code

As the result of a joint effort between the Waterbury Medical Association and the Waterbury Bar Association, a salutory and beneficial influence has been exerted upon the medical legal atmosphere of this medium-sized industrial town.

Problems presented by either physicians or lawyers which affect the societies as a whole have been settled by the unanimous vote of both professions. Information buttetins have been sent to all members of both societies concerning these decisions.

Here-with is presented the Interprofessional Code drawn up by the Waterbury doctors and lawyers:

"Acknowledging that a substantial part of the practice of medicine and law is concerned with the problems of persons who are in need of the combined services of a doctor and an attorney; and that the public interest and individual problems in these circumstances are best served only as a result of standardized cooperative efforts of all concerned; we, the members of the Waterbury Medical Association and the Waterbury Bar Association do adopt and recommend the following declaration of principles as standards of proper conduct for doctors and attorneys, subject always to rules of law and standards of medical and legal ethics established for their individual conduct.

INTERPROFESSIONAL RELATIONS

Each profession is obligated by its own stature to respect and honor the calling of the other. Neither the fact nor the appearance of incompetence, corruption, dishonest, or unethical conduct on the part of individual members of either profession can be tolerated. It follows then that both professions must vigorously support *within their own* ranks, those ethical concepts which each has found necessary for the public good. One who has chosen to be a doctor or an attorney and has been found competent to be such by appropriate authorities, is vested with high responsibilities and privileges to enable him to serve the public with honor, with dignity, and with effectiveness.

The following stated principles are a guide to the attainment of the best in interprofessional conduct and practices. It cannot be so detailed as to cover every circumstance:

THE COVER

THE OLIVER WOLCOTT HOUSE

LITCHFIELD, CONNECTICUT

Five men who signed the Declaration of Independence were identified with the practice of medicine. These were Josiah Bartlett of New Hampshire, Lyman Hall of Georgia, Benjamin Rush of Pennsylvania, Matthew Thornton of New Hampshire and Oliver Wolcott of Connecticut.

Oliver Wolcott was not only one of the great patriots of our State, he had the distinction of being a governor, the son of a governor and the father of a governor. When in 1747 he graduated from Yale College he was at once commissioned a captain in the Colonial Army by Governor Clinton of New York. Wolcott raised a company and marched to the defense of the northern frontier. In a few months he returned to Connecticut to study medicine with his brother Alexander who practiced in Windsor. Alexander Wolcott was important as a patriot in his own right. As a surgeon he had accompanied his father the second in command in the famous Louisburg Expedition.

Oliver Wolcott probably spent two or three years preparing for practice and about the year 1751 established himself in Goshen, Connecticut. After the County of Litchfield was organized he was appointed the first High Sheriff. From then on his activities were mostly those of public life. He was a member of the Continental Congress in 1775 and the next year was present when the Declaration was adopted and signed. After the riot in Bowling Green in which the statue of George III was hauled down and broken up the pieces were sent to Wolcott's house in Litchfield and there melted into bullets. This was done in a shed in the orchard adjoining this house on South Street which Wolcott had built soon after the establishment of Litchfield as the county seat.

Oliver Wolcott was in the field or attending Congress most of the time during the Revolution. He was in Congress when that body retired from Philadelphia to Baltimore in 1776. The next year he commanded a militia brigade in the battle of Saratoga. In 1796 he was elected Governor of Connecticut and the next year on December 8th he died in Litchfield. His son Oliver succeeded Alexander Hamilton as Secretary of the Treasury and later was elected Governor of Connecticut.

From Dr. Herbert Thoms' Collection.

for the tense and anxious patient...
sustained relief for 10 to 12 hours

Smooths out emotional peaks and valleys

'Meprospan'-400 brand of meprobamate contains 400 mg. in sustained-release form. One capsule smooths out the anxious patient's emotional peaks and valleys for 10 to 12 hours – and provides these other advantages:

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Side Effects: Rarely, skin reactions. May increase effects of excessive alcohol. Use with care in patients with suicidal tendencies. Massive overdosage may produce coma, shock, vasomotor and respiratory collapse. Consider possibility of dependence in patients with history of drug or alcohol addiction.

Available: *'Meprospan'-400* (meprobamate, sustained release) contains meprobamate 400 mg. *'Meprospan'-200* (meprobamate, sustained release) contains meprobamate 200 mg. Both potencies in bottles of 30. **Usual dosage:** One 400 mg. capsule or two 200 mg. capsules at breakfast; repeat with evening meal.

Meprospan®-400
meprobamate 400 mg.
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CME-9188

REPORTS OF ATTENDING DOCTORS

All requests for written reports from an attending doctor concerning his patient shall be made in writing by the attorney representing the patient. When such a report is requested, the attorney shall make clear in the written request for the report, *the specific condition* about which he seeks information and should indicate whether he is asking for a prognosis. The doctor, upon receipt of such request, should answer said request and furnish said report promptly.

The doctor in taking the history from a patient, shall deal *solely* and *purely* with factual statements for the purpose of determining the mechanism of injury.

All other requests for information made of an attending doctor concerning his patient shall be referred to the patient's own attorney. In the event that the patient has no attorney, no information shall be transmitted to anyone without authorization of the patient.

CONFERENCES

It is recognized that in most instances, it is necessary that a conference should be held between the doctor and the attorney proposing to call him as a witness. Prior to such conference, the lawyer should obtain, read, and analyze all available medical reports bearing on the case so that he can explain to the doctor the latter's role in the case. No lawyer should expect a physician to make a written report unless the lawyer advises the physician *in writing,* as to the type of information required. Such a request should be accompanied by a written authorization from the patient.

It is unfair to the patient-client, the physician, and the cause of justice to present a medical witness who has not first conferred with the attorney and who therefore may lack a full appreciation of the significance to the case of the particular evidence he is being asked to give.

THE PHYSICIAN AND COURT ARRANGEMENTS

In so far as it is their power to do so, attorneys should make advance arrangements for the attendance of doctors as witnesses. The doctor should be kept informed by telephone as to the progress of events. In the event that the presence of the doctor, after notification, is not needed in the court room, the attorney should so notify the doctor's office at once.

COURT APPEARANCE

As a witness, the doctor must at all times maintain the dignity of his profession answering questions objectively and concisely and using terms that are readily understandable to the jury. If he does not know the answer, he should so state.

He should never permit any bias, prejudice, or personal interest to influence his testimony.

The attorney, in like manner, in examining the medical witness, should avoid unfair or intemperate questions. If he should persist in such tactics, the medical witness should appeal to the court for protection.

PHYSICIAN'S CHARGES

The doctor is entitled to reasonable compensation for the time spent in conferences, in preparation of required or requested reports, in travel costs, and court or other appearances. The attorney must do his full part in *explaining* this fact to his client. *Under no circumstances may a doctor give medical testimony on a contingency basis.*

The responsibility for all medical charges relating to preparation for trial, conference, or attendance in the court room shall be the responsibility of the patient. The attorney must do his full part in explaining this fact to his client.

THE SUBPONEA

A subponea is an order of the court *commanding* a person upon whom it is served to attend at certain time and place and testify as a witness in the trial. Doctors, like all other citizens, are required to answer a subponea unless they have a legal reason to do otherwise.

In general, lawyers do not subponea doctors, but prefer rather to make an appointment for the doctor to appear in court at a favorable time. However, should a doctor be reluctant to cooperate, he should bear in mind that it is not only the lawyer's privilege, but his duty, to demand the doctor's appearance by subponea. To refuse to obey a subponea renders the doctor subject to contempt of court proceedings, which may result in a fine, imprisonment, or both.

In some states, a subponea is mandatory. In such cases, the doctor should be called by the lawyer prior to the issuance of the subponea explaining the nature of the document and that it is a routine matter required by law. This will remove the onus of such a subponea and the customary anticipated emotional reaction."

* * * * * *

To improve the interprofessional atmosphere between doctors and lawyers, there are certain "MUST NOTS," that is, certain types of conduct that must be avoided by both professions:

The doctor should refrain from giving advice on the law to his patient and, in testifying as a witness, should not assume the role of an advocate. It is for the physician to determine the actuality or probability of fact pertaining to the patient's condition. It is for the attorney to determine how and under what circumstances such facts are to be presented appropriately.

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No need to write three separate prescriptions for antitussive, decongestant and analgesic relief of common cold, flu or grippe symptoms when it is therapeutically correct... economically sound... to specify

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Codeine Phosphate*	15 mg.
'Sudafed'® brand Pseudoephedrine Hydrochloride	20 mg.
'Perazil'® brand Chlorcyclizine Hydrochloride	15 mg.
Phenacetin	150 mg.
Aspirin	200 mg.
Caffeine	30 mg.

*Warning—may be habit forming

'Emprazil-C' Tablets are available on prescription only.

Dosage: Adults and children over 12 years—1 or 2 tablets—3 times daily as required. Children 6 to 12 years—1 tablet—3 times daily as required. **Caution:** While pseudoephedrine is virtually without pressor effect in normotensive patients, it should be used with caution in hypertension. Also, while chlorcyclizine has a low incidence of antihistaminic drowsiness, the usual precautions should be observed. **Supplied:** Bottles of 100 tablets.

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A physician should never advise on the amount of damages a patient should seek to recover. The proper province of his professional advice is the extent, degree, or percentage of illness, injury, disability, or similar judgments based upon his professional knowledge of the case. He is not expected to understand or take a position on technical rules or legal liability, rules of evidence, or of trial techniques.

A physician must not divulge any information without proper consent of the patient.

He must not fail to render a prompt and complete report, when properly requested by a lawyer.

He must not fail to cooperate with any reasonable request to appear in court and must not fail to respond to a subponea.

He must not go to court to testify without being thoroughly prepared.

He must not guarantee any medical results.

A *lawyer* must refrain from giving *medical advice* to the client and should leave all medical problems to the doctor.

A lawyer, when he is first consulted, should explain to his client that a written report may be needed from fhe doctor, that a conference with the doctor may be essential, and that the doctor may be needed as a witness. The lawyer should further explain that such report, conference, or testimony may or will involve a charge for the doctor's time and that such a charge must not be a contingent one dependent on the outcome of the case, but will be an item of expense to be paid by the client, regardless of the outcome. The lawyer may advance the payment as a necessary, re-imbursable expense in his preparation of the case.

A lawyer must not fail to keep a doctor informed as to court appearances, court calendars, or settlements out of court.

He must not ask a doctor to increase his bill so that a larger recovery may be sought, nor should he encourage a client to seek a decrease in the doctor's charges.

He must not suggest percentages of disability to the doctor or request him to increase them once they are established.

He must not request a medical report without proper written authorization from the patient.

And finally, a lawyer must not harass or unnecessarily embarrass a medical witness on the stand.

It is our hope that many more such committees will be established in the future at the community level to foster better relationships, between the professions. Benefits cannot help but accrue to all of us, whether we be physicians, lawyers, or patients.

PETER V. C. DINGMAN, M.D.

The Electrocardiogram Is Not A Doctor

"We must observe without any preconceived idea. . . . But once a fact is noted and a phenomenon well observed, reasoning intervenes and the experimenter steps forward to interpret the phenomenon."

—Claude Bernard, *An Introduction to the Study of Experimental Medicine*

What Likoff first observed was a young man of sixteen in excellent health capable of severe physical exercise but whose electrocardiogram showed a pattern of myocardial infarction. This patient did not have pericarditis or myocarditis in any unusual form such as might accompany muscular dystrophy, sarcoidosis, amyloidosis, metabolic or neurogenic disorders. Perhaps he had coronary artery disease but coronary arteriography revealed patent vessels throughout. It is conceivable that this technique failed to reveal lesions positioned in the peripheral arteries which might produce minimal symmetrical narrowing which would escape detection by arteriography. But it is hard to see how such modest pathology could account for the significant electrocardiographic abnormalities that were documented in this patient.

Likoff, et al were however, alerted to the possibility that this case may represent a distinct recognizable clinical entity with an obscure etiology. It wasn't too long before they had collected five more similar patients, all young, vigorous healthy without any evidence of systemic disease, having in common two findings, grade 2 systolic murmurs near the sternum, and an electrocardiographic pattern of myocardial infarction. All were thoroughly investigated even to the point of visualization of their coronary arterial tree by angiography and gross obstructive coronary arterial lesions were not found. Could these patients have had non-coronary myocardial disease? The answer is no, because infection, collagen disease, amyloidosis, hemochromatosis, sarcoidosis, muscular dystrophy and metabolic abnormalities were all absent. Could the electrocardiographic changes have resulted from healed myocarditis? This remains in doubt because confirmation of this diagnosis and that of fibroelastosis and endomyocardial fibrosis cannot be obtained without tissue studies.

When electrical changes in the heart are observed in the electrocardiogram, it is generally not difficult to recognize causative factors clinically that are known to produce such changes. In fact the pattern of myocardial infarction in the electrocardiogram has been clearly documented over many years. But diagnostic dilemmas do arise when the electrocardiogram tells one thing and the clinical story

in
trauma (sprains/strains)

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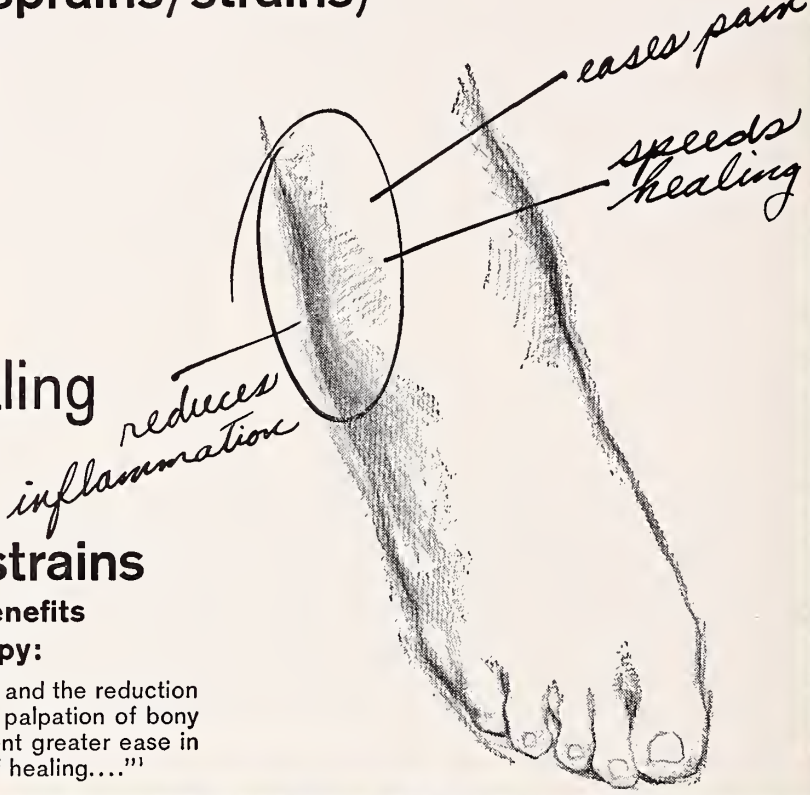

in sprains/strains

These objective benefits with enzyme therapy:

"rapid reduction of pain" and the reduction of swelling to permit "...palpation of bony landmarks with subsequent greater ease in following the progress of healing...."[1]

For best results, adequate dosage is important. ORENZYME, two tablets q.i.d.; dosage may be reduced to one tablet q.i.d. once symptoms begin to disappear. For severe conditions, parenteral trypsin and Orenzyme concurrently.

PARENZYME AQUEOUS [trypsin], 1 ml. injected intramuscularly (deep intragluteally) once or twice daily for several days, followed by Orenzyme, one tablet four times daily as indicated for maintenance.

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Side Effects: Side effects with Orenzyme are rare. If they occur, discontinuation of the drug is recommended.

Supplied: Bottles of 48 and 500 red, enteric coated tablets.

PARENZYME® AQUEOUS [trypsin]

Side Effects and Precautions: Side effects with Parenzyme [trypsin] are rare. Prolonged use occasionally causes itching and rash which may be relieved by antihistaminics. Local pain and induration at the site of injection may occur. The usual precautions should be observed as for the injection of any protein material. As a precaution, patients should be observed for about 15 minutes following an injection of trypsin. Epinephrine Injection, U.S.P. 1:1000 should be on hand for any systemic reactions.

Supplied: (1) In sterile **multiple dose** vial containing lyophilized trypsin 62,500 Units, N. F. (25 mg.), plus 5 ml. vial of aqueous diluent. (2) In sterile **single dose** vial containing lyophilized trypsin, 12,500 Units, N.F. (5 mg.), plus 1 ml. vial of aqueous diluent.

Compatibilities: There are no known incompatibilities for Parenzyme [trypsin] or Orenzyme. Other medications may be given with these preparations, if indicated. In infection, appropriate antibiotic therapy should be used concurrently.

References: 1. Lichtman, A. L.: Delaware M. J. **33**:11, 1961. 2. Lichtman, A. L.: Ann. New York Acad. Sc. **68**:196, 1957. 3. Golden, H. T.: Clin. Med. **2**:583, 1955. P-2384/63 7/63

Orenzyme® or **Parenzyme®** [trypsin]

(oral, enteric coated enzyme tablet 'National') U.S. Patent No. 3,004,893

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tells another. Then confusion arises because an electrocardiographic indictment is not supported by other clinical manifestations. How are we to resolve the paradox incidental to the discovery of an electrocardiagraphic pattern of myocardial infarction in patients who are otherwise well? Likoff et al resolved it by recognizing that an electrocardiogram is not a doctor and that a serious electrocardiographic abnormality calls for a thorough investigation to rule out organic disease. The six patients thoroughly investigated were all young. The juvenile pattern of T wave conversion associated with striking elevation of RST segment in leads to the right of the sternum are known. Even when they are found to the left of the sternum they tend to disappear with exercise. If after a careful clinical appraisal, the patient is found without organic disease the responsibility to make the diagnosis rests with the doctor not the electrocardiogram.

There is a tendency in some quarters to rely on the electrocardiogram to such an extent that if it is reported normal, it is assumed the patients heart is sound. We all know of the fallacy of this attempt to substitute a laboratory test for a clinical appraisal. Now we see the obverse side of the coin where a serious electrocardiographic abnormality is not itself evidence of a serious defect in the heart. That the electrocardiogram is a valuable aid to the doctor is now a truism, but it cannot and should not replace him. The electrocardiogram is not a doctor.

L.H.N.

References

1. Likoff, W., Segal, B. and Dreifus, L., Myocardial infarction patterns in young subjects with normal coronary arteriograms. Circulation, 26:373, September 1962.

Doctors And Fear Of The Computer

WILL THE COMPUTER MAKE THE DOCTOR OBSOLETE?

An article in *Science*[1] analyzes the "reasoning processes inherent in medical diagnosis" because of "the increasing interest in the use of electronic computers as an aid to medical diagnostic processes." The article is valuable in setting forth explicitly, with the technical displays of the symbolic logician, the statistician and the mathematical specialist in game theory, what is supposed to be going on in your head as you proceed to deal with a patient. Just as Mark Twain was amazed to discover that he had been talking prose all his life, you may be titilated to learn that you have been practicing a complicated minimax game against your adversary, the Grim Reaper, with interplay (helpful and otherwise) by the patient, his family and friends, society, and your profession. Fortunately, that wonderful, portable, unsurpassed computer, your brain, is so well designed that it functions without your needing to know which gear is meshing with what other—or should I have said neurone?

Still, there is need to understand what goes on. Complicated as is their description, the authors considerably oversimplify some aspects. Our input data are the symptoms and history volunteered and elicited and then amplified by further query as tentative possible diagnoses resonate in the doctor's mind. Physical examination, again under the sway of these resonances, leads to an array of signs (or their lack) which add to the data. Aside from routine laboratory tests, others, including roentgenography, are then performed in accord with the doctor's judgment.

This last process, judgment, is analyzed extensively by Ledley and Lusted. The physician is constantly comparing the likelihood and seriousness of a possible diagnosis with the time, cost, hazards, and availability of other tests to sharpen the differential diagnosis. Many other factors enter.

The patient, frequently before diagnostic procedures have gone far, must still be treated. The treatment, itself, may also have diagnostic value, aside from its importance in supporting the patient and maintaining a useful doctor-patient relationship. And treatment for one tentative diagnosis may be contraindicated for another. In the end, for all too many diseases, symptomatic therapy is often all that is found in our armamentarium.

Value judgments are constantly being made by the physician. The authors of the article are properly insistent that the doctor be able to separate explicitly his value judgments from his formal probability and logical conclusions. There should be little room for argument on the logical processes; it is in value weighting of different courses of action that differences arise irreconcilably. Let us know what we are doing and to what extent we are being guided by value judgments. Some values characterize mankind, others our culture, our religion, ourself, or our patient's value system. The obvious examples of difficult value choices such as therapeutic abortion, dangerous but otherwise life-prolonging operation, are extremes: almost daily the physician finds himself asked to advise between the value of giving up smoking and the pleasure of smoking, whether a marriage in the face of hereditary defects is appropriate; and he must decide for himself whether a gastrointestinal x-ray series is

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[1] Ledley, R. S., and Lusted, L. B.: Reasoning foundations of medical diagnosis. Science, 130: 9, 1959. A more recent and an excellent publication is the Symposium on Applications of Computers in Cardiovascular Diseases. Circ. Res. 11: No. 3 part 2, 1962.

A special margarine for the atherosclerosis diet

The latest report* in the *JAMA* on atherosclerosis diets states, "...it appears logical to attempt to reduce high concentrations of cholesterol and other serum lipids as an experimental therapeutic procedure."

Since this report recognizes table spreads as an important source of dietary fat, we believe that it is in your professional interest to know about the fatty-acid composition of Mrs. Filbert's Corn Oil Margarine.

Mrs. Filbert's Corn Oil Margarine is a special margarine** made from 100% corn oil, over 50% of which retains its liquid characteristics.

Because of its high linoleic content, its ratio of polyunsaturates to saturates is about 1.7 to 1... and equals the highest level available today in *any* corn oil margarine.

Of the total fatty acid content, 28% is *cis-cis linoleic acid.*

Moreover, when you recommend Mrs. Filbert's Corn Oil Margarine, your patient is assured of receiving unmatched taste and flavor satisfaction—an important consideration in promoting adherence to any therapeutic regimen.

*AMA Council on Foods and Nutrition: The Regulation of Dietary Fat, *JAMA* 181:411-423 (August 4, 1962).

**AMA Council on Foods and Nutrition: Composition of Certain Margarines, *JAMA* 179:719 (March 3, 1962).

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worth the trouble, cost, and radiation exposure to a patient who in great likelihood has no organic disease.

Already the computer in large medical institutions can start being used as a memory device to record for each disease its accompanying historical facts, signs, laboratory findings, prognosis under differing therapies. Eventually such data from many institutional sources, recorded in the increasingly wide-spread standard diagnostic terms, will be combined to increase the precision of conclusion. With this input in its memory, whether derived from one or many sources, the computer then can perform logical analysis to indicate the likelihood of any diagnosis as well as the most likely. It can reveal the more crucial data still needed to increase the probability of making a correct diagnosis. Lastly, it would be possible to program the computer in acordance with some of our value judgments, particularly those that are fairly widely accepted, so that logical decisions are first weighted by the simpler of our value systems before they are read out to the physician.

Certainly we have not yet reached the stage where such a procedure can be available, except in a few large research-oriented centers. To evaluate the unique combination of facts represented by each patient's many problems, to make sure that the information fed into the computer is of good quality, to understand the use of these new tools, to make soundly humane value judgments subtler than any present computer could deliver, will require professional skills and human understanding at least as difficult to develop and apply as is now the case in the practice of mediicne.

FEAR OF THE COMPUTER

Why does all of society so fear the computer as a modern Frankenstein? Humorous cartoons showing a computer run amok paper the bulletin boards of computing centers; they have been clipped from scientific and lay publications. Regularly, the newspapers regale us with variations on the theme of the humble clerk whom the company's computer pays with a check for some astronomical sum of money. The reason is that the computer *is* like a Frankenstein in its remorseless, tireless pursuit of its instructions. As a child, I remember our peals of laughter over the response of young Michael's moronic older brother to his mother's shouted instructions when she found herself locked out of her apartment house: "Throw my key out of the window!" Mikey was unceremoniously but dutifully tossed out the window. Mikey's older brother (putting psychiatric explanations aside) behaved like a computer in understanding "my key" to be "Mikey" and there was in him (in the joke) no supplementary computer program to prevent the dire consequences of such a mistake. The humor in the joke resides in the inhuman automaticity which we, as children, would like to display at times to our siblings, yet against which our minds are "programmed" because we are humanly ambivalent, loving our siblings too and also fearing punishment by conscience and society.

Our real fear, then, is that a computer will act before it can be stopped (so called "real time" computers that impliment their decisions immediately) or will present decisions that have a great aura of veracity because of their logical sources but which are nonetheless incompatible with our other feelings and attitudes. Such a situation may arise when the computer is not as completely programmed as we are. So far, there seems little likelihood that such completeness can be achieved.

To take an example, suppose, in order to reduce the number of guards needed, a computer device were programmed to shoot anyone who did not wear a guard's uniform, if he started to enter the water of a river alongside a penal colony. If an off-duty guard were swimming and suddenly started to drown, no prisoner could safely go to his rescue. Yet a guard, if *he* were manning the gun, would not shoot a prisoner bent on rescuing the drowning man. It is the unlikely, the unforseen, that may cause inhuman conduct or decision by a computer that worries us. We are right to know that we must limit our genie to act for human ends that a genie cannot always perceive for itself. Man is the true measure of man.

Harold Lamport, M.D.

Critical Periods In The Development Of Learning

It was Freud who suggested the importance of early experience and pointed to the existence of critical periods in behavioral development. He attempted to explain the origin of neuroses in human patients as a result of early experience and implied that certain periods in the life of an infant are times of particular sensitivity. All subsequent experimental work on both animals and humans have brought strong support to the concept of critical periods in behavioral development.[1]

The phenomenon of critical periods of learning was first noticed in children, rather than lower animals. McGraw[2] took one of a pair of identical twins and gave him special early training. The onset of walking was not affected by previous practice or help. Certain other activities however could be speeded up. The favored twin became adept at roller skating almost as soon as he could walk. In other activities however, because of the formation of unskillful habits, performance was actually made

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Side Effects and Precautions: Prolonged administration can produce mild hirsutism, acne or voice change. In an occasional patient, edema has been observed and in young women the menstrual periods have been milder and shorter. These side effects are reversible, and patients receiving prolonged treatment should be examined and questioned periodically so that, should side effects appear, the dosage may be reduced or administration of the drug discontinued for a time.

In patients with impaired cardiac and renal function, there is the possibility of sodium and water retention. Liver function tests may reveal an increase in bromsulphalein retention, particularly in elderly patients. In such cases, therapy should be discontinued. Although it has been used in patients with cancer of the prostate, its mild androgenic activity is considered by some investigators to be a contraindication.

Dosage: Usual adult dose, 1 tablet t.i.d. before or with meals; young women, 1 tablet b.i.d.; children (school age): up to 1 tablet t.i.d.; children (preschool age): ½ tablet b.i.d. Available as scored tablets of 2 mg. in bottles of 100. For best results, administer with a high protein diet.

*ANIMAL DATA

Rx WINSTROL (stanozolol/Winthrop) whenever anabolic therapy is indicated

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worse. McGraw concluded that there is an optimum period for rapid and skillful learning for each kind of co-ordinated activity and that there are critical periods for learning which varies from activity to activity.

Similar experience has been obtained in rats. The maximum learning effects seemed to be limited to the period of approximately 20-30 days of age which corresponds to immediately after weaning. After 20-30 days there appears the pattern of fearful behavior in response to strange situations and that development of fear limits the capacity for future learning. Before the fear response, discrimination learning could be improved by gentle handling beginning at twenty days.

In some performances the critical period of learning is a relatively long one. Thorpe[3] discovered a critical period for learning a characteristic song in the chaffinch. If isolated for three to four days of age a young male chaffinch produces an incomplete song. If he hears adult singing as a fledgling of two to three weeks old, he will sing the next year, the song characteristic of the species even if he has been kept in isolation. But at one year the critical period is over once he has learned one complete song. Scott wonders whether learning a complete song pattern in some way interferes with further learning. But perhaps the nervous system of the bird has but the capacity for retaining only one song.

There appears to be a critical period for learning to fight through social experience. Thus King and Gurney[4] found that adult mice reared in groups during their youth, fought more readily than animals isolated at twenty days of age, and most of the effect was produced in a ten day period just after weaning. The effect was probably produced by association with other mice before the fear response had been completely developed. Fox terriers when reared in isolation during the critical period of socialization, were similarly inhibited in their attacking behavior. Such animals never initiated conflict and fought back ineffectually if attacked.

Both sexual and maternal behavior fail to develop normally if rhesus infant monkeys are reared apart from all other monkeys beyond the period when they spontaneously play with their fellows. Harlow[5] discovered that rhesus infants reared on dummy mothers did not develop normal patterns of sexual behavior and to obtain normal behavior, the young monkeys had to be allowed twenty minutes of daily play periods with other monkeys. The results suggest that play has an important role in developing adult patterns of social behavior in these primates, and that the decline of play behavior sets the upper limit of the critical period during which normal adult behavior may be developed.

In humans there is a critical period for learning the sex role. Money, Hampson and Hampson[6] have studied the development of hermaphroditic children who have been reared as one sex and then changed over to the other. If the change occurs before the age of two and one-half years very little emotional disturbance results. Apparently the critical period persists up to the point in development when children begin to use and understand language. Perhaps more important, this is the age when children begin to take an interest in and play with members of their own age group.

Scott points out that not enough is known about the timing mechanisms which must certainly be based upon the development of learning capacities. In dogs, rhesus monkeys and human infants, learning capacities change during development, some times in a stepwise fashion. One element is the ability to learn things which facilitated subsequent learning. If, however, attempts are made to teach before the capacities are ready, then learning will be impaired, and the individual may "learn not to learn" bringing the critical period to a close. This is a well known phenomenon in attempting piano instruction at too early an age.[7] On the other hand certain learning potential is lost if the critical period is past and the fear reaction has appeared. Thus what is learned at a particular point limits and may interfere with subsequent learning and what has been learned at a particular time in development may be critical for whatever follows. Scott presents the provisional general hypothesis that "the critical period for any specific sort of learning is that time when maximum capacities—sensory, motor, motivational, as well as psychological ones are first present."

A great deal of information is needed regarding the optimum periods for acquiring motor and intellectual skills which depend on the rate of maturation of the various organs. It is probable that each behavioral and physiological phenomenon is associated with a different critical period of development. But what is already known is that the critical period effects are more common early in life than they are later on. We may even expect to find that the periods will turn out to be similarly specific and concentrated in early life. In short we must learn the potential benefits for each period of life so we can take advantage of them. We should also learn the dangers for each period of life so we can learn to avoid them, or having occurred, learn how to overcome them. For as Schneirla and Rosenblatt pointed out, what is learned at a particular

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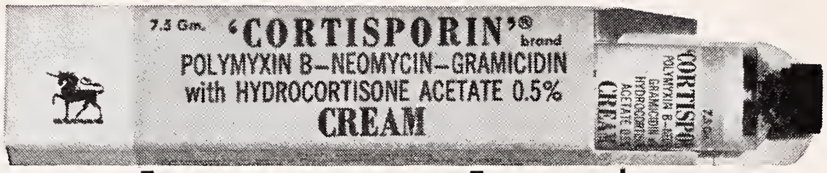
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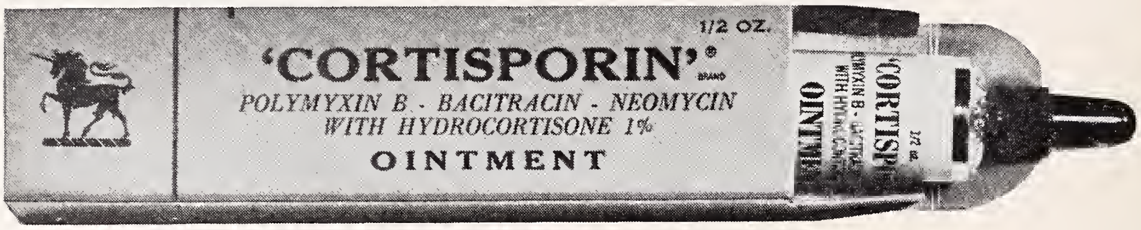

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point limits and interferes with subsequent learning and in fact may be critical for whatever follows.[8]

The concept of the critical period is a highly important one for animal and human welfare. We must encourage the experimental work that is going on aiming at discovering and utilizing critical periods in development. For they should lead to greater realization of the capacities possessed by human beings. Without such knowledge, generations have been brought up, habitually uncritically and doubtless inadequately. When such knowledge becomes available human beings should be able to reach their highest potential, for we will then be master of the interaction between man's biology and his culture. Then human evolution will take a real spurt forward. As Dobzhansky states "Man's future inexorably depends on the interactions of biological and social forces. Understanding these forces and their interactions may in the fullness of time prove to be the main achievement of science."[9]

L.H.N.

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Anti-Infective Agents In The Treatment Of Diarrhea

Acute infectious gastroenteritis is a major cause of disability in all countries, and of death, especially in infants, in countries with a low standard of living. Most viral and bacterial diarrheas in older children and adults are, however, mild or self-limited, need no specific chemotherapy and can be adequately controlled with symptomatic measures. If an attack of diarrhea lasts more than a day, or is accompanied by blood or pus in the stool, the physician should start symptomatic treatment promptly with fluids, electrolytes, and demulcent or opiate drugs, and identification of the pathogen should be attempted.

Laboratories which use fluorescent antibody techniques are able to identify Enteropathogenic E. coli (EPEC) in the stool, and possibly other organisms, in a few hours, facilitating the quick choice of an antibacterial agent; stool cultures take a day or two. In epidemics, stool cultures and sensitivity tests on a number of the early patients will give valuable clues to the infecting organisms and antibiotic susceptibility patterns.

Infectious gastroenteritis may be caused by viruses, bacteria, or protozoa. Specific chemotherapy, when necessary, depends on what organism is assumed or determined to be responsible. Among the bacteria causing diarrhea, Enteropathogenic E. coli (EPEC), Shigella and Salmonella are most important. At times, entero-viruses become an important cause of diarrhea.

ENTEROPATHOGENIC E. COLI – EPEC is more frequently implicated in infant diarrheas than any other organism. Orally administered non-absorbable antibiotics, such as polymyxin B, colistin, neomycin, kanamycin and furazolidone, are reported to be more effective against EPEC in infants than tetrocycline and chloramphenicol (M D. Yow, Pediat. Clin. N. Amer., 10:163, 1963).

It is not clear whether the better results obtained by Dr. Yow with the non-absorbable drugs are due to the higher stool levels resulting from lack of absorption, or to the higher frequency of resistance of EPEC strains to tetracycline and chloramphenicol. Strains of E. coli resistant to neomycin and other non-absorbable antibiotics may also be responsible for occasional severe infections, however, and require the use of other antibacterial agents. Whatever agent is used, relapses and chronic carrier states may occur, even in patients who have received the full course of treatment (7 to 10 days).

SHIGELLA—Except against resistant strains, a sulfonamide should be used in Shigella infections. The classical study of A. V. Hardy (Public Health Rep., 61:857, 1946) demonstrated that an absorbable oral sulfonamide such as sulfadiazine was more effective against sensitive strains than were several non-absorbable sulfonamides. Many strains are now resistant to all sulfonamides, but some of these are susceptible to tetracyclines.

Relapses and the chronic carrier state have been problems with tetracycline and chloramphenicol and, in such cases, colistin, polymyxin B, neomycin or kanamycin can be tried.

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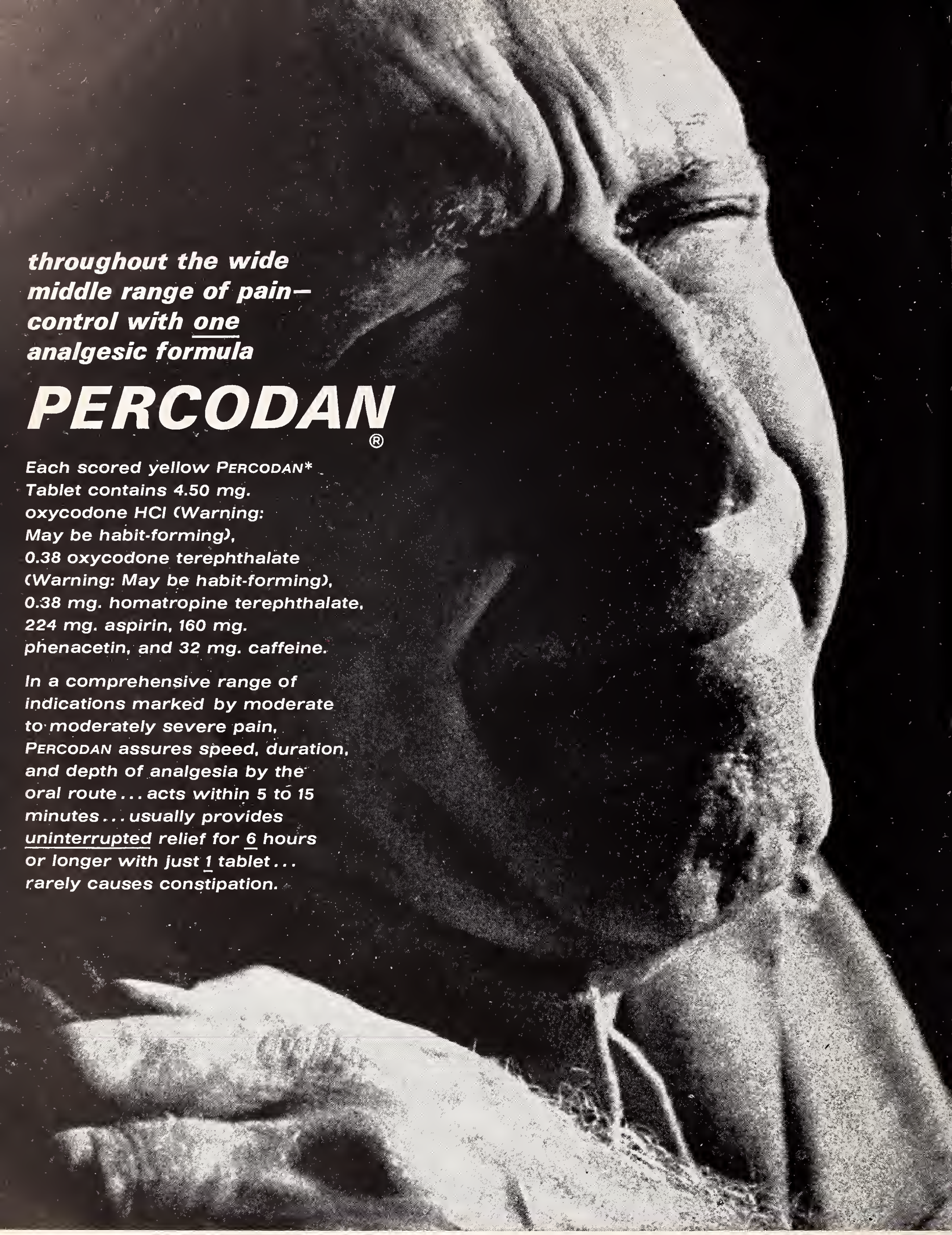

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THE PRESIDENT'S PAGE

In the August issue of Connecticut Medicine, I wrote of my impressions of the A.M.A. convention in Atlantic City. I expressed my surprise and gratification at the number and the high calibre of the friends of medicine. One who impressed me deeply was the young Congressman from Indiana, Donald C. Bruce. He is a tall, ascetic-looking young man, with the voice and gestures of an orator. But his "Statement of Principles" was what impressed me most. Even without the imprint of his personality, as he expresses his principles, I think you will find them profound and right. In all modesty, Congressman Bruce lays no claim to originality in enunciating his principles. Indeed he gives due credit to the *Beaver County* (*Pennsylvania*) *Times,* in which an editorial entitled, "The Rise and Fall of Your Democracy," first expressed these truths so well.

"YOU CANNOT BRING ABOUT PROSPERITY BY DISCOURAGING THRIFT."

"YOU CANNOT STRENGTHEN THE WEAK BY WEAKENING THE STRONG."

"YOU CANNOT HELP THE WAGE-EARNER BY PULLING DOWN THE WAGE-PAYER."

"YOU CANNOT FURTHER THE BROTHERHOOD OF MAN BY ENCOURAGING CLASS HATRED."

"YOU CANNOT ESTABLISH SOUND SECURITY ON BORROWED MONEY."

"YOU CANNOT HELP THE POOR BY DISCOURAGING THE RICH."

"YOU CANNOT KEEP OUT OF TROUBLE BY SPENDING MORE THAN YOU EARN."

"YOU CANNOT BUILD CHARACTER AND COURAGE BY TAKING AWAY MAN'S INITIATIVE AND INDEPENDENCE."

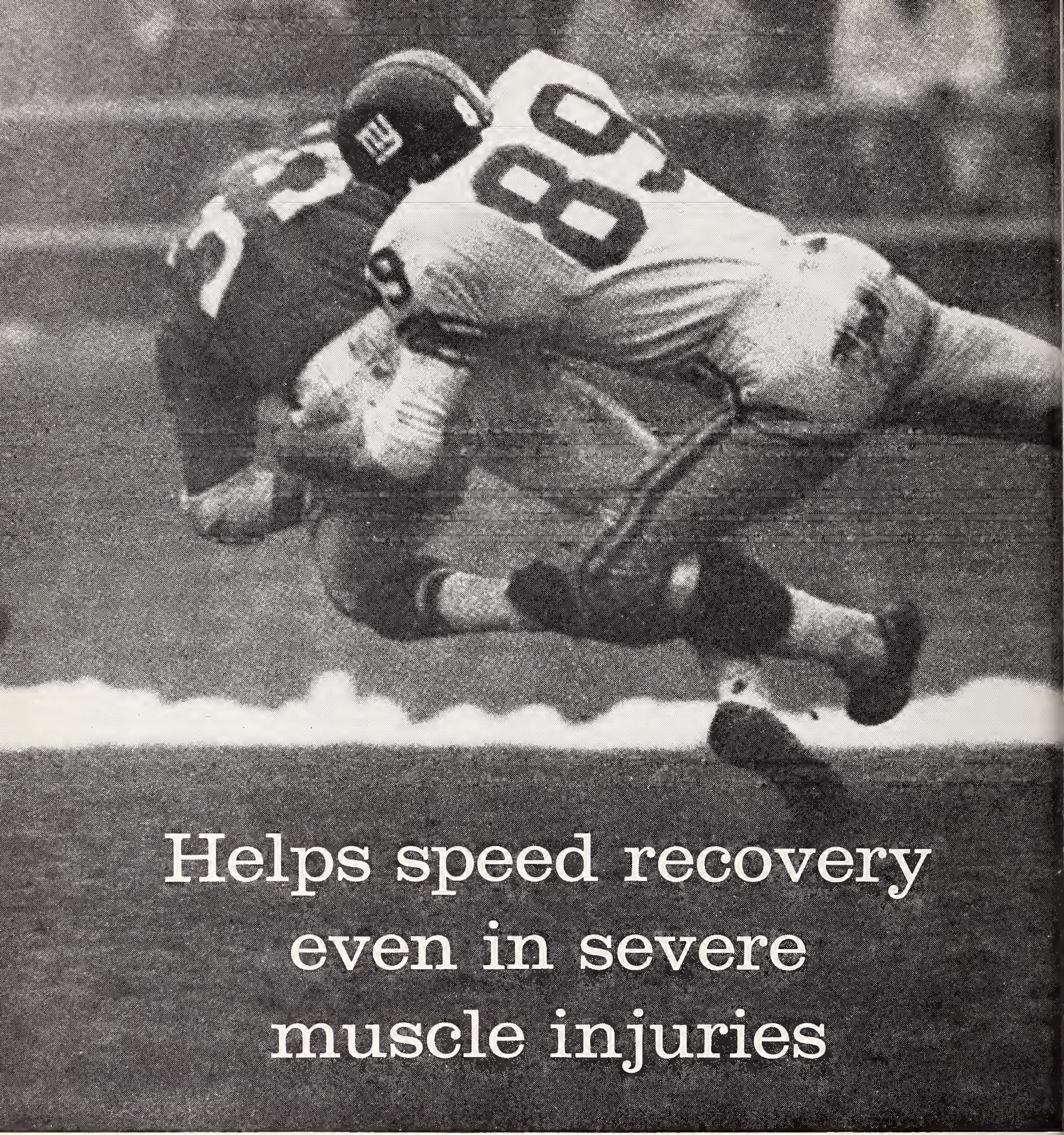
"YOU CANNOT HELP MEN PERMANENTLY BY DOING FOR THEM WHAT THEY COULD AND SHOULD DO FOR THEMSELVES."

History shows that most democracies last about 200 years. Our democracy is sixteen years away from the end of it's second century. Speaking of democracies, historian Channing Pollock said: "They are conceived and developed by simple, vigorous, idealistic, hard working people who, unfortunately, with success become rich and decadent, learn to live without labor, depend more on the largess of big government and end by trading domestic tyrants for foreign tyrants."

Dr. John R. Stanbaugh, vice chancellor of Vanderbilt University, has put it this way: "The historical cycle of the body politic indicates that man progresses from bondage to spiritual faith, from spiritual faith, to courage, from courage to freedom, from freedom to abundance; and then comes the waning, from abundance to selfishness, from selfishness to apathy, from apathy to dependency, and from dependency right back into bondage again."

I hope you find these principles and commentaries as inspiring as I do. Certainly they give us food for thought.

Morris P. Pitock, m.d.



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Medical Malpractice—I. Causes

By Joseph F. Sadusk, Jr., M.D.

■ During my senior year as a student at Johns Hopkins Medical School a quarter of a century ago, the subject of medical malpractice was briefly discussed during part of a lecture by Judge O'Dunne during his course on Medical Jurisprudence. His remarks were brief indeed, essentially acquainting us with the fact that there was such a thing as malpractice, and that as future physicians we might some day see such a rare and ungracious person who would have the effrontry to sue us! Little did I then realize that 27 years later, I would fly well over 2000 miles into the Pacific to be one of two persons speaking for the entire morning on this subject. Obviously, something has happened during this 27 years. Why it has happened, and further – what can we do about it is the subject of this morning's presentations.

The first malpractice action[1] in the United States was recorded against a Connecticut physician in 1794, but the problem remained dormant for almost a century and a half thereafter. The number of cases began to pick up during the 1930's, increasing more rapidly in the 1940's (and particularly after World War II), and finally culminating in the astoundingly rapid rise of malpractice suits in the 1950's. What the 1960's will bring I don't know, but the continuing rise in malpractice insurance premiums during the first part of this decade bodes evil for the future.

The malpractice hazard has increased everywhere throughout the United States, the only difference being that it is worse in some areas than others. Not only has the number of cases multiplied beyond all expectation, but so also has the size of claims paid and judgments rendered. Settlements and judgments toward and in the six figures are no longer a rarity. An out-of-court settlement of $317,000 was made last year in New York City for a woman suffering from cerebral cortical damage when cardiac arrest followed respiratory problems after a spinal anesthesia. Another out-of-court settlement in California several years ago resulted in a $290,000 payment, again for brain damage. Brain injury alleged to be due to improper care during birth led to a New Jersey jury last year awarding $250,000. I could go on at some length mentioning other awards which some attorneys would term "adequate," but I believe I have made my point.

Definitions

Now, before we go any further let us first define a few terms. What do we mean by medical malpractice? Back in the 14th century, specifically in 1374, a British court[1] held "if a surgeon does so well as he can and employs all of his diligence to the cure, it is not right that he should be held culpable." This basic concept was maintained through the years and was upheld in the American courts[1] by the famous William Howard Taft in 1897 when he said: "A physician is not a warrantor of cures. If . . . a failure to cure were held to be evidence, however slight, of negligence on the part of the physician or surgeon causing the bad result, few would be courageous enough to practice the healing art, for they would have to answer financial liability for nearly all the ills that flesh is heir to." Would that our modern courts remember this statement when they so freely apply the *res ipsa loquitor* doctrine!

Enlarging a bit on the definition of medical malpractice, one may say that the law requires that a physician who undertakes to diagnose and treat a patient must possess at least the average skill and knowledge possessed by other physicians in the same locality and further, he must apply his skill and knowledge in a careful and prudent manner. Failure to do this constitutes medical malpractice. If the physician holds himself out to be a specialist he must meet the standards of practice of those other specialists in his designated field of practice

Presented before the International Medical-Legal Society, Honolulu, February 20, 1962.

DR. JOSEPH F. SADUSK JR. is Professor and Chairman of the Department of Preventive Medicine and Community Health, George Washington University School of Medicine, Washington, D. C.

and in his area. That professional services may be rendered without charge makes no difference in the legal interpretation of the doctor's responsibility. He is just as liable to a claim of malpractice when he affords free care as he is if he charges for his service.

Now, *malpractice* is not a proper descriptive term since it implies that the physician who is so charged is a bad doctor. This is not necessarily so since the best qualified and the most conscientious physician may commit errors since he is a human and further, one of his assistants — such as nurse, technician, or an associate physician — may err. In such a case the law may consider this error to be the physician's negligence. In addition, we all know that many malpractice suits originate because complications occur beyond the control of the physician and where there is no actual malpractice or negligence. Consequently, during the past ten years the term *professional liability* has been used in place of medical malpractice since it connotes a certain type of liability incured by the doctor in his daily practice and which now is to be looked upon as an occupational hazard. I shall use both terms — *medical malpractice* and *professional liability* — interchangably in my presentation.

Such terms as *statutes of limitations* and *res ipsa loquitor* deserve definition. State legislatures have enacted laws requiring injured persons to bring suit within a specified period of time after they have received their alleged injuries. These laws, known as statutes of limitation,[2] consequently limit the time within which a person may commence legal action for personal injuries, breach of contract, and etc., against the defendant. Applied to medical malpractice, these statutes define the time period within which a patient may sue a physician for professional misconduct or negligence.

The provisions of statutes of limitation vary from state to state, not only as to the length of time allowed to bring legal action, but also as to when the time begins to run, factors that prevent the time from running, types of legal action covered, and so forth. In some states the length of time is relatively short, and in other states, the length of time within which a patient may sue may, under certain circumstances, is extended to many years. Consequently, the physician must know what the specific provisions are for his own state.[2]

The basic theory of our law is that "he who accuses must prove" — applied to medical malpractice, this means that the plaintiff patient must prove his allegation of malpractice against the defendant physician by the introduction of expert medical testimony during the court proceedings. Under certain circumstances, however, such expert medical testimony may not be required, as when the court applies the doctrine of "res ipsa loquitor." Literally translated, the term means "the thing speaks for itself." Basically, this doctrine simply indicates that negligence may be proved by circumstantial evidence The doctrines may be applied under the following circumstances:

1.) The accident or injury is of a kind which ordinarily does not occur in the absence of someone's negligence, and
2.) It is caused by an instrumentality within the exclusive control of the defendant, and
3.) The possibility of contributing conduct which would make the plaintiff patient responsible is eliminated.

As Morris[3] has pointed out, the increasing tendency for the courts to apply this doctrine leads to liability without fault. It also means that the defendent physician is looked upon as guilty when he takes the stand and must explain away this inference of guilt.

The Factors

Let us now discuss the various factors which play a role in the origin of cases.

In this discussion I shall draw heavily from our California experience where the problem has been carefully studied and concrete facts are available. These investigations, which were pioneered on a county level in the Alameda-Contra Costa Medical Association[4], the county in which I practice, were later extended to state level under the auspices of the California Medical Association.[5] Since then, these studies have been substantially confirmed on a national basis through a questionnaire evaluation carried out by the Legal Division of the American Medical Association.[6] Agreement at all three levels — county, state, and national — has been remarkable for the major professional factors.

Professional Factors

I should first like to take up with you what I shall term the "professional factors." By this, I mean those factors which are directly related to medical care by the physician.

Our studies reveal that the age of the physician, the sex of the physician, whether he does general practice or a specialty, and the type of area in which he practices, play little or no role. I know that some of you believe, and this may be true in certain parts of the country, that physicians practicing in rural areas are not as susceptible to malpractice hazards as those physicians who practice in a truly urban area. At least for California, this is not true. To support my statement I would invite your attention to the fact that just his year the

National Bureau insurance companies finally discontinued differential premiums for physicians practicing medicine in rural versus urban areas in California.

It may also be of considerable surprise to some of you to know that there is no significant malpractice hazard difference between the physician who does general practice and the physician who practices a specialty. Indeed, we went even further in our studies to differentiate physicians, breaking down the specialist into those who were Board certified and those who were not Board certified, and breaking down general practitioners into those who were certified by the American Academy of General Practice and those who were not. Suffice it to say that there was no essential difference among the groups.

Actually, we found the most important professional factor was simply that related to the type of medical work which the doctor performed upon the patient.

We found, first, that over two-thirds of malpractice cases are surgical in nature. This does not mean that the physician doing surgical work is more careless or negligent than other physicians. It just means that surgical procedures are more hazardous. When we further broke down surgery into its component sub specialities, we found that obstetrics and gynecology led the field while orthopedics was a close second. This finding may not necessarily be true elsewhere in the United States where orthopedics continues to lead traditionally. At any rate, general surgery follows as a third subgroup and then follow the other surgical subspecialties.

In contrast to surgical procedures which account for about two-thirds of all malpractice claims, the strictly medical fields of practice such as internal medicine, neuropsychiatry, pediatrics and laboratory, are next in line, accounting for slightly less than one-fifth or 20 per cent of all claims. Here, toxic drug reactions play the major role with neuropsychiatric problems following, and finally pediatrics and laboratory problems.

Next in order — and each equally important — and totaling about five per cent of the total claims, are allegations of failure of equipment-producing injuries such as diathermy, hot water bottle, heat lamp, and electrosurgical burns. There then follows a miscellaneous group, again about five per cent, such as falls from examining tables, allegations of assault and battery, undue familiarity, and etc.

Finally, in our California experience, come the radiological problems — principally x-ray and/or radium burns which account for several per cent of all claims. I should point out however that this is not necessarily true in other states where x-ray injuries may account for a significantly higher percentage. Why this difference, I don't know.

Now, what I have just related to you indicates that it is the type of medical work which the person is doing that makes for a malpractice claim. It is clear that surgery is a hazardous field and in which serious damage can be done, and consequently there are going to be more claims for such injuries. In the medical fields, potentiality for damage is of course less and we necessarily find a lower percentage.

Another important point which you should realize is the fact that 70 per cent of malpractice claims arise from work performed in the hospital. This is, of course, a reflection of that fact that major surgery and the hazardous medical and diagnostic procedures are performed here.

Patient-Physician Relationship

Now, let us probe deeply into other reasons for which a patient sues a doctor, regardless of whether the case is surgical or medical. Here we enter upon the human relations aspect, perhaps more commonly termed the patient-physician relationship.[7]

I must emphasize to you that the importance of this factor is not universally accepted and indeed, much controversy still remains even in California where these pioneering investigations into the human relations causes of malpractice claims were made several years ago. In these studies, what I had long suspected was found true — that some malpractice suits were basically a symptom of breakdown in the patient-physician relationship. In these instances, what made patients likely to sue not infrequently had very little to do with the patient's medical treatment or with the doctor's skill, training, or competence. Simply speaking, the malpractice suit is a symptom that arises when disappointment and anger predominate after a bad medical result, and patient and doctor do not understand each other. It is a symptom that usually means that the patient (and sometimes the doctor) have attitudes, expectations, and personal traits that make it hard to deal with the intense emotions that arise in the patient when he despairs of health or help, and in the doctor when he senses the loss of the patients admiration or his own self-respect.

We found the problem to be a complicated one, involving three inter-related items — the patient, the physician, and our present cultural setting.

In many instances, the suit-prone patient was found to be childish, suspicious, and prejudiced and dogmatic, overly dependent upon the doctor, unrealistic about medicine and its limitations and medical fees, and unable to cope with his emotional problems. He wanted the doctor to be omnipotent, thought everything should be curable, but thought that doctors and hospitals charged too much, and distrusted organized medicine. He was preoccupied with money, did not dislike people who sued, and used money as a means of expressing his feelings. He tended to change doctors frequently and while he fawned upon his new doctor, he severely criticized those concerned with his past medical treatment.

Taking these traits as a whole, it can be seen that the suit-prone patient fails to take appropriate responsibility for his own care. His unrealistic expectations of doctors and medicine renders him particularly susceptible to disappointment. Further, it is disappointment of a sort that he cannot innerly accept as part of his own doing, and he therefore must blame others. He leans unrealistically on the doctor — wanting him to have god-like powers, but simultaneously distrusts what the doctor can do for him. He focuses on his own problems in a self-centered way and is unable to see the problems of others. He is quick to seize upon an untoward event to brand the doctor as incompetent but at the same time it is not possible for him — because of his blindness to his own emotional needs — to talk the matter over with the doctor. Thus, his inner rage finds no outlet except in complaint to family and friends, who are likely to agree with him, thus adding to the anger directed at the doctor. In brief, these suit-prone patients are unrealistic and troubled people who therefore act immaturely in the doctor-patient relationship.

On the other hand, we also found that those physicians who were repeatedly sued seemed to be lacking in true self-confidence, were dependent upon their patients for self-satisfaction, and were generally unable to be warm and friendly persons. Consequently, when the patient becomes afraid or angry, this threatens the doctor's precarious sense of importance. As a result, such doctors may replace a desired friendly and warm atmosphere by rigid rules and demands that are not expressed in words.

Now, this does not mean that every patient who sues or every doctor who is sued is psychologically inadequate. But it does mean that if the doctor can maintain the respect and confidence of his patient when things go wrong he may well prevent a malpractice suit.

Cultural Setting Of Our Times

Another important factor is the cultural setting of our times. Many changes have come about in our country during the past half century. One of these important changes is a philosophy which tends to make the public think of success, or punishment, or human life, in terms of money. Present society tends to sanction suits since the punishment is monetary in nature. In other words, the public looks upon suing as a commonplace matter in this day and age.

Other Factors

There are doubtless other factors which play a role in malpractice but these are complex and difficult to evaluate. I should, however, like to explode a few myths.

First, I don't believe that attorneys start malpractice cases, though it is doubtless true that some cases are fertilized by certain lawyers.

Second, I don't believe that physicians ordinarily start malpractice suits. It may be true that occasionally an injudicious or critical remark by a physician may start a patient to believing that a previous doctor has been negligent, but our California studies show that such is rare. What actually happens is that the patient may quote such remarks — which may or may not be true — but this comes long after she has already considered her previous physician to be negligent. Usually, the patient thinks of malpractice herself, and many times family and friends plant the seed of legal action.

You doubtless have noticed that I have slipped into the use of "she" in describing the malpractice plaintiff. I've done this on purpose because it is well known that the majority of such plaintiffs are female.

Finally, let me give you a few broad generalizations as to other factors which I truly believe but which I must point out are my own thoughts and for which I cannot support by scientific study.

First, medical advances reported by the lay press have caused the public to believe that doctors are infallible; hence, if all does not go well the patient is likely to consider that his doctor was negligent. In addition, we've had a critical press during the past decade or two because organized medicine has made decisions which are not popular with press, public, or the government.

Second, as medicine advances with the use of potent medications and the employment of dramatic surgical procedures which advance the span of life and save patients who otherwise would die, so also do these advances increase the chances of irreparable damage to the body when complications occur. That the patient is living makes no difference to him—he is impressed, on the contrary, that the physician has damaged him and he may show his displeasure by filing a malpractice claim. For instance, the introduction of cardiac resuscitation by open or other methods has led to difficult legal problems when the patient lives but ends up with irreversible brain damage. The story is completed when a settlement is made or a jury awards damages for a quarter of a million dollars.

Third, there is no doubt that the public is becoming more litigation-minded and wants to be paid for injuries, be they caused by the physician or the automobile driver. To further this aim, attorneys have brought to a high degree of perfection those trial methods which convince a jury that the plaintiff is deserving of what is called an adequate award.

Fourth, and perhaps one of the most important factors, is the orientation of the courts toward the plaintiff leading to the construction of doctrines in his favor. Such doctrines are responsible for our present trend[8] toward *liability without fault*. In other words, if a person is injured the changing philosophy of the courts leads to the concept that society should pay for his injuries, such as is done for the worker under the Workman's Compensation Act.

Summary

Medical malpractice claims are becoming a burdensome problem for today's practitioner of medicine. The explanation for the rising incidence and cost of such claims is complicated and is doubtless due to a number of factors. The type of medical work performed, the patient-physician relationship, the cultural setting of our times and the orientation of our courts toward liability without fault doubtless play important roles.

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INFORMATION

"ROUTINE" LABELING OF PRESCRIPTIONS

At its August 15th meeting, the Joint Conference Committee of the Connecticut State Medical Society and the Connecticut Pharmaceutical Association adopted resolutions as follows:

(1) CONCERNING THE 'ROUTINE' LABELING OF PRESCRIPTIONS AS TO CONTENTS: "The Joint Conference Committee *cannot* concur with the resolution recently adopted by the AMA Council on Drugs relative to the 'labeling of prescriptions as a general (routine) practice,' and is . . . unanimous in its opinion that no drug (ingredient) name should be placed upon a prescription label (by the pharmacist) if (*yes* and *no*) 'boxes' are used (on the prescription form) and (the *yes* box) is not checked by the practitioner at the time he writes the order (or if such labeling is not otherwise specifically requested by him)."

(2) CONCERNING THE LABELING OF PRESCRIPTIONS AS TO "EXPIRATION DATE": "The Joint Conference Committee . . . is (unanimously) opposed to the routine labeling of prescriptions with 'expiration dates.' The pharmacist is the person best qualified to use professional (judgment and) prerogative as to when expiration dating may be necessary." (N.B.: It is understood that, in practice, this opinion would not apply if the medical practitioner *specifically requested* that the "expiration date" appear on the prescription label.)

Medical Malpractice–II. Prevention

By Joseph F. Sadusk, Jr., M.D.

■ Now that we have discussed the causes of medical malpractice, let us address ourselves to a discussion of its prevention.

Since doctors are human beings, and human beings do make mistakes, we can never completely eradicate malpractice mishaps. However, we can do much toward reducing such mishaps to an irreducible minimum. We can certainly try to eliminate malpractice in the careless, dishonest, and incompetent physician by controlling the work which he is permitted to do, particularly in the hospital. We can also attempt to educate the courts, the press, the public, and the attorneys to the problems of the physician. And above all let us adopt the motto "What is good for the patient is good for the doctor." Let us not seek to prevent the patient from obtaining redress when malpractice is committed, but rather let us do everything to prevent those acts of omission or commission which lead to a charge of malpractice.

National Level

I should first like to discuss what has been done at national level. In 1954, the problem of malpractice reached such magnitude for the physician that a number of resolutions were presented to the House of Delegates of the American Medical Association, requesting advice and assistance in the field of professional liability. Late that year, the Board of Trustees directed the Law Department of that organization to review the problem and to plan and initiate appropriate studies on the subject. The Law Department's analysis covered state insurance laws and regulations, state statutes of limitations, analysis of the type of reported cases, professional liability claims involving physicians in government service and in civilian practice, surveys of pertinent state legislation, surveys of state and national medical societies, and finally, the preparation and publication of special articles[1,2] on the subject of medical malpractice. A number of medicolegal films were prepared in cooperation with the American Bar Association for educational purposes, and are available to physicians through the American Medical Association.

These studies were classical in nature and set a pattern for guidance of physicians at local level. In addition, the AMA joined in cooperation with the American Bar Association to publish an interprofessional code at national level and similar codes were encouraged at state and county levels. Such codes have contributed much to an understanding between the physician and the attorney, causing each to recognize the other's problems.

Close cooperation with the American Hospital Association was promoted, leading to the formation of a joint AMA-AHA Committee on Medicolegal Education.[3,4,5] This committee did much to clarify joint liability problems of the physician and the hospital.

Finally, the AMA began a recurring series of regional medicolegal conferences to which were invited not only physicians but also attorneys. Again, mutual problems between the physician and the attorney were brought out on the table for frank discussion and clarification.

Local Level

Let us now review what has been done at local levels.

State Malpractice Committees

Several states have set up committees within their state medical society to review and advise on the professional liability problem. New York state with

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Presented before the International Medical-Legal Society, Honolulu, February 20, 1962.

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its Medical Review and Advisory Board of many years standing set the pattern for this type of committee. California adopted a similar type of committee, composed of physicians highly qualified in the field of malpractice. This California Medical Review and Advisory Board has carried out basic studies on the subject of malpractice and has disseminated this information to its component members.

Group Malpractice Insurance Programs

Group malpractice insurance programs have been promoted throughout the United States. To the public this may seem of benefit only to the physician. However, such group programs necessarily lead to a careful analysis of the problem and do much to promoting better standards of care for the patient by educating the physician to the hazards of medical practice. For the first time, in these group insurance programs, the doctor has learned what actually constitutes a comprehensive and satisfactory insurance coverage for his liabilities in practice.

Hospitals

Hospitals, thanks to the stimulation of these group programs, the efforts of the joint AMA-AHA Committee on Medicolegal Education and the guidance of the Joint Commission on Accreditation of Hospitals, have carefully reviewed the standards of medical practice, have reappraised the awarding of surgical privileges to their staff, and have set up Tissue Committees within the hospital for critically reviewing surgery.

Malpractice Review Committees

Committees of physicians have been set up at state and county level to review malpractice charges levied against their physician members. Since such committee reviews are not generally available to the plaintiff patient, some attorneys say that the decisions are one-sided or that the "deck is stacked" against the plaintiff. However, I can assure you, after over ten years experience in such committee reviews, that the opposite is true. The truth is that these review committees undertake a thorough and critical study of the patient's allegations and the facts as presented by the physician. Some of these committees even have a laymember with full voting privileges.

Expert Medical Testimony

Committees or panels usually at local county level, have recently appeared, basically pointed to a solution of the need for expert medical advice and testimony for the plaintiff malpractice patient and his attorney. These groups have taken several forms to suit the local need.

Attorney-Physician Review Panels. One example is that of the Joint Attorney-Physician Review Panel. Such a panel was initiated in Arizona about 5 years ago and has become known as the Pima County Screening Plan. This plan continues to function and is a reflection of the good relationship which exists between the attorneys and physicians in the city of Tucson.

The Pima County Plan works in the following manner.[6] The panel consists of an equal number of doctors and attorneys of Tucson which act in joint session to screen malpractice claims filed against medical doctors in Pima County. When a member of the Pima County Bar has a malpractice claim against a physician brought to him, he writes to the Chairman of the Bar Association's Medical Legal Committee asking that the claim be screened by this Joint Panel. The doctor is then informed by the Chairman of the Committee, a hearing is set and the physician is invited to be present and participate with the plaintiff in the panel proceedings.

After hearing the evidence, the panel then renders a decision based on two questions: (1) "Is there any *substantial* evidence of malpractice, as that term is defined by the Arizona Supreme Court?" and (2) "Is there in the facts presented any *substantial* evidence of *substantial* injury arising out of the malpractice?" If the answers to both questions are yes and an equitable settlement cannot be reached, the medical society then undertakes to produce competent medical testimony for the claimant to prepare for trial and to afford expert medical testimony in behalf of the claimant during the court proceedings.

The theory of this plan is that if the panel does not find substantial evidence of malpractice and injury, the attorney involved will not file suit. In addition, the deliberations and discussions of the panel are confidential within the panel and no member of the panel can be asked to testify concerning panel proceedings.

It perhaps is still too early to know what the final outcome of this plan will be, but so far the plan is said to be working well. Similar plans have been initiated in Davenport, Iowa and Reno, Nevada.

Expert Witness Panels. Another example is that of expert witness and advisory panels.

The difficulty involved in obtaining expert medical testimony by a physician in personal injury — let alone malpractice cases — is well known. This is not necessarily due to the physician's unwillingness to cooperate with the law, but rather to the fact that he is cast into an atmosphere foreign to his training and philosophy. The physician is trained as a scientist to present medical data and conclusions in a narrative and factual manner and to elaborate on the pros and cons of the medical problem. Due to the adversary system of trial in the United States, this is not generally possible. Under such a system, the physician replies to a series of questions which, when put by an experienced trial attorney, may modify, twist, and distort the true medical story.

The need for expert medical testimony in malpractice cases was realized in California and as a result of meetings between the California State Bar and the California Medical Association, a plan to afford such expert advice and witnesses was set up in September of 1957.[7] First, you must clearly realize that this panel of physicians does not meet or advise in joint session. The panel is essentially a list of qualified doctors from which an attorney may draw a physician of his own choice, who then becomes his medical adviser in the case, and goes to court to testify if the attorney wishes him to do so.

Such panels have been set up by the county medical and bar associations in Los Angeles, San Diego, and San Francisco. These panels of physicians generally represent the fields of general practice, internal medicine, surgery, obstetrics and gynecology, pediatrics, pathology, and radiology. In order for a physician to qualify for service on this panel, he must first attend certain indoctrination lectures presented by the local bar association. A panel member is called for duty by the complainant attorney's request in writing. Depending upon the individual case, the physician may review only pertinent records, or he may also examine the patient. He then submits his report in writing to the patient's attorney. In the event the case goes to trial, the physician panel member is obligated to testify in court. No reference is made in court to the panel or to the medical or bar association's participation therein.

In the event the patient's attorney is not satisfied with the report of the first panel physician, he may secure an examination or consultation with a second member of the overall panel, providing he and his client waive the confidential nature of the first examination or consultation so that the first physician may be examined in any civil action based on the complaint involved.

To again reiterate the basic principles of the California plan, this plan furnishes a medical expert to advise the patient's attorney and to testify in court if necessary. In this plan, the panel does not meet as a group; there is only and strictly an advisory relationship between the complainant's attorney and the panel physician.

I understand that very recently the Utah State Medical Association has established a panel of physicians who may be called upon for assistance by plaintiff attorneys. However, the physicians on this panel may not be used as witnesses in malpractice cases.

Now perhaps I have taken too much time in discussing general principles of malpractice prevention, so let us get into those things which the individual physician can do about the problem himself.

The Individual Physician

In very general terms the physician should exhaust efforts to establish a diagnosis before embarking upon medical or surgical treatment, and he should utilize conservative approaches to treatment before using radical and dangerous methods.[8]

Medical Treatment

With regard to strictly medical treatment, the indiscriminate overuse of medications must be avoided and there should be a demonstrable reason for the use of any drug. Second, there should be a concrete diagnosis, so the physician knows what he is actually treating. Third, the physician should utilize the less toxic agents before employing dangerous drugs if time and diagnosis permit. Fourth, the physician should adequately explain these possible hazards to the patient before embarking upon a therapeutic course since experience has demonstrated that the patient is less likely to criticize if he had know of these hazards. Fifth, the physician should employ safeguards, both clinical and laboratory, to detect such toxic manifestations in their early stage before irreversible damage takes place.

Shock Therapy

With regard to shock therapy, the physician should know of the dangers to be faced, namely, induced fractures, cardiac arrhythmias, and myocardial infarctions. Sufficient need for such shock therapy should be demonstrated. It is wise to routinely take x-rays before and after shock therapy of those parts of the skeletal system especially vulnerable to fractures such as the spine. A careful cardiovascular survey including electrocardiogram is indicated in the case of the middle aged patient. The family should of course be warned of such possible complications of shock therapy if the patient is incompetent.

Surgical Procedures

With regard to surgical procedures, the physician should realize that all surgical procedures are hazardous but that certain procedures are more hazardous than the usual reparative or curative surgery. Aortograms and angiography, myelograms, cisternal punctures, needle punch biopsies, cardiac catheterization, and cosmetic plastic surgery and scarring dermatological procedures stand out in importance.

In surgical procedures particularly, an informed consent is important. The surgeon should not attempt to by-pass or avoid questions from the patient as to possible complications, but on the contrary should freely present the problems to him before surgery is done. Indeed, if the operation is a particularly hazardous one, the surgeon would do well to obtain an acknowledgement of risk statement from the patient. It is sad that the time has come when we as physicians can no longer protect the complacency of the patient, but this day has long passed by.

Anesthesiology

The field of anesthesiology is a relatively new one and certainly is to be recognized as hazardous, particularly with respect to the use of spinal and caudal anesthesia. Here again, a frank discussion with the patient should be had to secure an informed consent. The anesthesiologist should not evade the fact that these methods can produce irreparable damage.

Orthopedics

With regard to orthopedics, I am sure that every physician has been well indoctrinated as to the need for x-rays of the appropriate part of the skeletal system even in seemingly trivial injuries. The need for post-reduction x-rays to show good alignment of fractures must also be emphasized. When it is clear that good results either cannot be or are not being obtained, the early use of consultation is desirable for determination of the proper course to follow. Even the accomplished orthopedist should seek such consultation since the judgement of two physicians will survive under legal scrutiny better than one opinion.

Obstetrics And Gynecology

The seemingly non-hazardous field of obstetrics and gynecology is emerging, as I have previously noted, as a hazardous field from the standpoint of medical malpractice claims. The increased number of claims in this specialty chiefly concern severed ureters and vesicovaginal fistulas following hysterectomy. While such complications are looked upon as necessary hazards to the operation, the malpractice charge may have merit if the reasons for the performance of the hysterectomy are inadequate since any layman on the jury knows that the complication would not have occurred if the operation had not been done. Also, we must realize that the field of obstetrics carries a dual hazard since the obstetrician has two potential claimants, mother and infant.

X-Ray And Radium Therapy

The field of x-ray and radium therapy is a traditionally hazardous type of practice since tissue destruction and severe burns may necessarily result from such treatment. It is basic that the physician doing such practice be well qualified in his work, and that his apparatus and equipment should be well metered and monitored. His technicians must be carefully supervised.[9] Here, the question of informed consent is most important. The patient should be bluntly acquainted with the possible dangers of irradiation before beginning such therapy, particularly when heavy dosage is indicated. The signing of an acknowledgement of risk form or an exchange of letters may be desirable in certain instances.

Radioisotopes

While the use of radioisotopes is potentially hazardous, practical experience up to the present does not indicate that this is a serious problem. However, only the future will settle long term professional liability problems. Meticulous detail should be included in the medical records and needless to say, these records should be retained for the long term future.

Diagnostic X-Rays

Diagnostic x-ray claims are relatively few in number and principally deal with the failure of diagnosis, particularly when fractures are missed.

Experimental Medicine

With regard to experimental medicine, certain points stand out. Experimentation should be done only with the knowledge and consent of the patient or for those responsible for him, and then only if the treatment does not vary too radically from accepted methods of practice.

To practice experimental medicine, certain ethical, legal and moral aspects must be observed. The Judicial Council of the American Medical Association has stated three requirements[10] which must be fulfilled: (1) The voluntary consent of the patient on whom the experiment is to be performed, (2) The danger of each experiment must be previously investigated by animal experimentation, and (3) The experiment must be performed under proper medical protection and management. Whether experimentation takes the form of investigation of new and unreleased drugs, transmission of disease entities, or experimental surgical procedures, a written and witnessed agreement between patient and physician is required. It should be clearly understood by the physician that such a contract does not relieve him of the charge of negligence if reactions or complications occur, but does serve to indicate that such unconventional drugs or procedures were carried out with the knowledge and understanding of the patient.

Medical Records

The importance of keeping adequate medical records cannot be overemphasized, since many malpractice cases, otherwise defensible, are lost because of inadequate records. Complete details of history, physical findings, and treatment should be outlined for office and hospital care. Needless to say, similar records should be maintained for home visits. It is also desirable to record the basic details of telephone conversations with patient, especially with regard to treatment prescribed. Prescriptions telephoned to the pharmacist should be recorded as a matter of record in the patient's medical file.

Patient-Physician Relationship

Let us now go into the human relations aspect of medical malpractice prevention. What can the physician do about the problem of patient-physician relationship breakdown? He should first ask himself a series of questions. Is he dependent upon his patient's praise for doing a good job? Does he risk the loss of self-confidence by doing work which may go wrong if he doesn't know enough about the procedure? Does he lack warm and friendly relations with his patients, but not to the point of a father-son or father-daughter relationship where the patient becomes overly dependent upon him? Does he consider himself omnipotent?

From the standpoint of the patient, he must learn to recognize the unreasonable and unrealistic suit-prone patient. Beware of the patient who enters your office on the first visit fawning upon you, telling you what a wonderful doctor you are and in the same breath relating how terrible other doctors are and how they have mistreated her. Don't be psychologically seduced — you will be the next doctor on her "bad" list when she leaves you. If your treatment goes well she will love you, but if it doesn't, she will hate you and may exhibit this hate in the form of a malpractice suit.

Having recognized the suit-prone patient who enters your office what should the doctor do about her. First, he doesn't necessarily send her elsewhere. He should remember that these patients are not necessarily dishonest or amoral. However, if he finds their personalities clash and he feels uneasy or unhappy when she returns for visits to his office, he should not continue with her care. He should frankly explain the situation and confess that he believes she may be better off elsewhere.

In continuing with the treatment of these patients, we should tell them what they may realistically expect of treatment and make clear to them that we cannot guarantee good results. Forewarn them of possible problems and risks. We should not undertake serious or dangerous treatment—whether medical or surgical—until we are certain the patient fully understands the possible consequences. Also, we should commit the patient to responsibility for the decision to undergo treatment. If possible, bring the family in to witness these discussions and decisions — they will be less likely to criticize if things go wrong. Permit the patient to talk out these worries with you in a friendly and relaxed atmosphere. Don't hurry her and if things do go wrong in treatment, take time to explain what happened and why it happened.

With dangerous medications and procedures, make full use of consultation for protection and support. Use specifically written consent forms if there is any doubt. Examples of such forms are available from the Legal Division of the American Medical Association.

Finally, when an event occurs which may be construed by the patient as medical malpractice, your first concern should be for the feelings of the patient. Don't procrastinate — discuss the matter with the patient at the earliest opportunity — and also with the patient's family. You must be prepared to accept the anger and fear that this patient will feel and vent upon you — but you should know that your patient will be helped by your feelings of sympathy for her.

If you do these things, you may well be spared a malpractice claim even if you have unwittingly committed an error.

Malpractice Insurance

Now, things will go wrong under the best of circumstances and you will make errors which you can't defend. I hope you have prepared for this by protecting your patient and yourself by malpractice insurance coverage.[11] Secure adequate coverage[12] — the amount will depend upon your field of work, the locality in which you work, and how impressed you are by the gradual but pernicious effect of inflation. Remember that in some states you may be sued many years after the incident, and the insurance policy which you had during the year of the incident is the one which covers you, not the policy you hold when you were sued. Choose an insurance carrier which has been in business for years, and which gives promise of existing for many more years. Don't seek a low premium; rather seek adequate coverage from a United States firm which ranks high among insurance companies in term of net assets, years of existance, reputation for prompt settlement of valid claims, and which is licensed by the State Insurance Department to do business in the state where you are engaged in practice.

Above all, read your policy carefully — you may be surprised at some of the exclusions. A final point, in my opinion, is that group coverage at local level, if available, is the best coverage. The next best coverage is a national group society program, remembering of course that selection of a good insurance company is of primary importance.

Summary

In final summary, I should like to tell you what Dr. Richard Ford[13] told the members of the Massachusetts State Medical Society in 1950: "The prevention of medical malpractice depends upon three points: Good faith, good records and common sense. *Good faith* implies that the physician treat his patient with tact and kindness, that he conceal no known difficulty in diagnosis or treatment, and that he advise consultation freely. *Good records* require that the physician adequately document the medical records of his patient and carefully record untoward happenings, and make a matter of record the treatment given and the advice offered. *Common sense* implies that the doctor know the vindictiveness of some patients, recognize the hazards connected with the collection of reluctant fees, be aware of the failure of equipment that in turn can produce injury, and use only well established medications and surgical procedures."

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> The safest and most impregnable ground on which social advancement can be founded is the universality of affections. It is the bond of our common humanity; it is the golden link which joins together and preserves the human species. Affection can warm the coldest temperament and soften the hardest heart.
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> —Quoted by Harry E. Bacon

Malpractice Litigation

The California Experience

By Joseph F. Sadusk, Jr., M.D.

■ I have been asked to discuss with you tonight our California experiences with medical malpractice and to present the results of our studies in such details as time permits. It is perhaps appropriate that we bring this subject up to date in Connecticut since your state has the first recorded case of a malpractice suit in the United States against a physician (Cross vs. Guthrey, 2 Root 90, Connecticut, 1794). Over 150 years ago a Dr. Guthrey was sued by the husband of the deceased who alleged that the doctor was guilty of negligence in the care of the plaintiff's wife and in his words "in the most unskilled, ignorant, and cruel manner, contrary to all the well-known rules and principles of practice in such cases, that the defendant had wholly broken and violated his undertaking and promise to the plaintiff to perform said operation skilfully and with safety to his wife." The jury found the doctor liable and awarded damages of £40, a not inconsiderable sum in those days.

In the past, the law with regard to malpractice cases was quité explicit and fair to the physician and perhaps best expressed by the learned British justice who said over five centuries ago: "If a surgeon does so well as he can and employs all of his diligence to the cure, it is not right that he should be held culpable." And indeed, our famous William Howard Taft said at the turn of the century: "A physician is not a warrantor of cures. If . . . a failure to cure were held to be evidence, however slight, of negligence on the part of the physician or surgeon causing the bad result, few would be courageous enough to practise the healing art, for they would have to answer financial liability for nearly all the ills that flesh is heir to."

But the picture has changed. The complexity of modern medical practice, a series of evolutionary decisions leading toward liability without fault, an increasingly critical public and inflation have altered the picture. The problem has been compounded further in some states by statutes of limitations which continue the liability of physicians for years after the alleged malpractice incident. Indeed, the problem of malpractice has increased to such an extent that authorities have developed and are using the term *professional liability* to indicate that malpractice charges have become a vocational hazard for the physician.

In some areas of our country not only has the number of cases multiplied beyond all expectation, but so has the size of claims paid and judgments rendered. Settlements and judgments in six figures are no longer rare.

Now, it is well known that California leads the country in many things, including malpractice hazards! By 1946, the situation in Alameda County of California—which is just across the bay from San Francisco and in which the cities of Oakland and Berkeley are located—had become so bad that insurance companies lost their interest in furnishing malpractice insurance coverage through brokers on an individual physician basis. It was obvious that the physicians themselves would have to do something about the matter on a group basis through a carefully monitored program.

The American Mutual Liability and Insurance Company of Boston, a newcomer to the field, agreed to set up such group coverage, provided two principles were followed: first, this was to be a coordinated program in which the insurance carrier, the legal counsel, and a very carefully selected committee of physicians would evaluate each complaint or suit alleging malpractice on the part of a participating physician; second, if negligence or malpractice on the part of a physician appeared to be present, or if the case were indefensible, a just and prompt financial remuneration would be made to the patient. On the other hand, if there were no merit to the charges brought against the physician,

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the doctor would be vigorously defended. Under no circumstances would a "nuisance claim" payment be made to settle a trifling allegation as is commonly done in other types of liability insurance and which was the philosophy of the San Francisco bay area in malpractice until 1946.

This program was successful and expanded through northern and central California to include about 5,000 physicians in 23 counties over the past decade. We found that the "nuisance claim" virtually disappeared because attorneys knew that the physician would not settle for several hundred dollars just to avoid the embarrassment of going through a legal process.

You should also know that for the past ten or more years, a layman serves on the review committee, with full power of discussion and vote. He usually has been selected from among the prominent clergymen of the area.

At the beginning of the program, there were no data to enable us to determine the basic causes of true malpractice. This information simply did not exist, so we began the careful collection of statistics and facts. By 1955, we had assembled enough material for analysis, and in 1956, we published in the Journal of the American Medical Association a nine-year experience of an analysis of the professional factors in medical malpractice claims.

During that period, 94 suits were filed and 515 complaints were made. Of the 94 suits filed, 2 were lost by the defendant physician in court and judgment consequently rendered; 18 were settled since the review committee considered the claim to be meritorious on the part of the patient; 21 suits were won, 15 were dismissed by the court, and 38 were still pending.

Of the 515 complaints made, 436 were dismissed by the committee as being totally without merit. 31 resulted in an indemnity of $100 or more being paid to the patient since the committee considered the claim to be with merit. 48 claims were still outstanding at that time. This gave us a total of 125 malpractice incidents to review.

Here is what the review brought out. The age and the sex of the doctor played no role in the malpractice hazard. Neither did his location of practice play a role; he was just as susceptible to being sued if he practised in a rural area as if he practised in the city. Whether he was a specialist or a general practitioner made no difference and indeed, even Board Certification in a specialty did not change the picture.

But here are the factors which did have significance. First, the type of medical problem involved was of paramount importance. Surgical procedures accounted for 70 per cent of all claims and suits, with obstetrics and gynecology leading the surgical field. Next followed orthopedics, and then general surgery.

The field of medicine *per se* produced 20 per cent of claims, toxic drug reactions leading the field and then followed by neuropsychiatric and pediatric incidents.

After medicine, the remaining areas of practice were relatively unimportant with a few per cent here and there of radiological (principally x-ray and radium burns) injuries; injuries due to failure of equipment such as the Bovie unit and the diathermy machine producing burns; and finally, a miscellaneous group such as allegations of assault and battery, undue familiarity, etc.

The second point of importance was found to be that of the hospital itself since there was an unusally wide spread of malpractice incidence among the hospitals in the county for the acts of their physicians. The number of malpractice incidents per 100,000 admissions ranged from 2.2 to a high of 56 with a median of 14 for a group of sixteen hospitals. Incidentally, 70 per cent of the incidents occurred as a result of treatment in the hospital.

The third point was that of a certain group of physicians who had multiple claims or suits levied against them and who appeared to be "malpractice prone." Here, 14 physicians who constituted only one per cent of the county medical association membership, accounted for 24 per cent of the indemnity and expense paid out.

At the time this study was published, we were very guarded in our interpretation since the study was a relatively small one. However, a considerably larger and more extensive study, which we carried out on 700 claims in 1957 throughout the entire state of California under the auspices of the Medical Review and Advisory Board of the California Medical Association, substantially confirmed the validity of our earlier studies.

This later study, however, did suggest that the field of neurosurgery was the most hazardous specialty, orthopedics was next, and obstetrics and gynecology was third.

These, then were the professional factors. But it seemed to us that there must be other factors dealing with the patient-physician relationship; otherwise, how could one explain the many claims and suits without merit? In addition, we knew there were cases of malpractice in which the patient did not sue the physician, such as retention of foreign bodies after surgery and the like. And finally, it was clear that what made the patient likely to sue or doctor likely to be sued had very little to do in the majority of instances with the patient's medical treatment or with the doctor's skill, training or competence. Consequently, we believed that the malpractice suit was basically a breakdown of the patient-physician relationship.

We then inquired into this aspect. Dr. Richard Blum, who was a Research Psychologist of the Stanford Research Institute, was brought into the California Medical Association to carry out these studies. A well controlled investigation was initiated, utilizing patients who had sued and contrasting them with patients who had been under similar types of care but who had never sued a physician or pressed a claim for malpractice. Similarly, doctors who had multiple malpractice claims were contrasted with doctors who had never been so charged.

The findings were interesting—though I must tell you that the conclusions to be drawn remain controversial, primarily since these were exploratory and early studies. We found that the patient likely to sue a doctor had certain personality characteristics and fell into a group which we have termed the unrealistic or unreasonable person. These patients were generally immature, suspicious, dependent, dogmatic, were prejudiced, and had little self esteem. They denied or did not understand their own emotions, and were generally low in intelligence. They thought that everything should be curable, they wanted their doctors to be omnipotent. They were dissatisfied with their doctors, changed doctors frequently and visited doctors frequently. They believed that they didn't get well fast enough, and further, they blamed the doctor for their seemingly slow recovery. They were suspicious of organized medicine and distrusted doctors as a group. They thought that hospital nurses neglected them. They were afraid of illness. They were preoccupied with money, they thought that doctors and hospitals charged too much, they were suit conscious, they did not dislike people who sued, and they used money as a means of expressing their feelings.

Now, there was no evidence that these suit-prone people were crooked, dishonest or amoral. Indeed, because of their dependent admiration of doctors, they definitely found it difficult to sue. But they did fail to take appropriate responsibility for their own care, and their unrealistic expectations of doctors and medicine rendered them particularly susceptible to disappointment. Further, it was a disappointment of a sort that they could not innerly accept as part of their own doing and they therefore blamed others. This self-protecting device expresses itself best in the suit-prone patient's history of changing doctors, his complaints of slow recovery, and his trick of always finding fault in so many medical situations. He leans unrealistically on his doctor, and he wants the doctor to have god-like powers, but he simultaneously distrusts what the doctor can do for him. He focuses on his own problem in a self-centered way and is unable to see the problems of others. The fear of illness, coupled with the desire for a scapegoat, inclines him to blame the doctor if anything—imagined or actual—goes wrong. He is quick to seize upon an untoward event to brand the doctor as incompetent, but it was not possible for him—because of his blindness to his own emotional needs—to talk the matter over with the doctor. His inner rage finds no outlet except in complaint to family and friends, who obviously are likely to agree with him, and thus add to the anger directed at the doctor.

Our studies of the doctors who were repeatedly sued showed certain interesting characteristics for this group. This type of physician was dependent upon his patients and yet he could not attain a close friendship with them. He tried to do too much by himself and yet was likely to blame others if anything went wrong. He disliked his patients but yet could not do without them. It is because of such inner conflicts that the suit-prone doctor cannot deal effectively with the difficult emotional problems generated by his own immature relationships with suit-prone patients when complications occur. It is difficult for him to see or understand his problems; consequently, it becomes difficult for him to admit to anger, error or lack of insight.

Another point brought out in the study was our present cultural setting. Here, there is no doubt that we are developing a society which specifies that legal action with a monetary award is the most acceptable way of expressing the angers generated by unsatisfactory doctor-patient relationships.

The attorney handling malpractice cases seems also to be somewhat different from other attorneys. He is a person interested in obtaining personal power and is especially concerned with individual rights and social injustice. Generally, he does not think of his clients as people with emotional problems, although he sometimes recognizes the crucial role of the doctor-patient relationship as the origin of the suit. He does not think of suit patients as being malicious. He tends to regard the medical profession as a sort of trust that protects members even when they are wrong. He invariably believes that litigants would not get a "square deal" from insurance companies or doctors unless they are represented by counsel. He complains freely that doctors will not testify in malpractice cases and that, in general, doctors are unwilling to cooperate with attorneys. But in his favor, it should be brought out that malpractice attorneys generally recommend or institute action in less than half the malpractice complaints that patients bring to them. They are almost never responsible for the original idea of suing.

Now, I pointed out before that actually few malpractice cases in fact reach the courtroom. In our own California experience, for those which do, well over 90 per cent are settled in favor of the defending doctor. This percentage is high in California, since physicians there have had a forward-looking policy that recommends prompt and fair settlement out of court for patients who have justifiable complaints.

We have demonstrated that it is a certain type of patient, under treatment by a certain type of doctor, who frequently sues as a means of expressing his anger towards the doctor. If the patient and doctor can handle the problem satisfactorily, there is little chance that a suit will develop. However, given the suit-engendering situation, it is usually the patient who discovers what he deems to have been malpractice and it is the patient who decides to sue. He usually does so without telling the doctor, by delivering his complaint to an attorney. In such cases, probably considerably less than half, does the attorney recommend action, and when he does, and if it is with merit, it is usually settled out of court. The cases that do get into court—and these are presumably the unwarranted cases—are almost always won by the doctor.

The fact remains, of course, that neither the doctor nor the patient wants a malpractice suit. What can we do about it? Here are some points which I would like to suggest for the physician.

Patients who are likely to sue can usually be identified by their unrealistic outlook upon life and their attitudes towards illness, medicine and doctors. It is part of your task as doctors to be competent in recognizing such people. Such patients should be told what to expect in treatment, and what the fees will be. They definitely should be forewarned of possible problems or risks, and serious or dangerous treatment should not be undertaken without being certain that the patient understands the possible consequences. Also, be sure that before treatment is started the patient commits himself to being responsible for the decision to undergo treatment.

Permit your patient to talk out his worries in a friendly and respectful atmosphere which you provide for him. Use consent forms, make free use of professional consultation to confirm your thoughts in problem cases, and keep careful medical records.

Now, what should you do when you become aware that an event has occurred that the patient might construe as medical malpractice? Your first concern should be for the feelings of the patient. You should immediately discuss the matter with the patient and even sometimes with the patient's family. You must expect and accept the anger and fear which the patient may feel and which he may heap upon you. But, you should also realize that your patient will be helped by your feeling of sympathy for him.

Now, one final point which I should like to discuss with you. You should know—if you do not already realize it—that attorneys who specialize in malpractice suits do not have a high opinion of organized medicine, which they see as a coercive and self-protecting trust, and uninterested in the rights of patients. Certainly, closer cooperation between lawyers and doctors would be effective in changing these ideas.

And now, just a few words on what the California Medical Association has done in the interest of seeking justice in professional liability. In saying a "few words" I am reminded of the time that Justice Frankfurter is alleged to have said, after coming to the end of a decision, "and now just a word on this point"—after which he went on for 40 more pages. Rest assured, however, that I am not in the good Justice's class; consequently, I shall not detain you too long.

The difficulty involved in obtaining expert medical testimony from the physician in personal injury—let alone malpractice cases—is well known. It is due not to the physician's unwillingness to cooperate with the law but rather to the fact that he is cast into an atmosphere foreign to his training and philosophy. The physician is trained as a scientist to present medical data and conclusions in a narrative and factual manner and to elaborate on the pros and cons of the medical problem. Due to the adversary system of trial in the United States, this is not generally possible. Under such a system, the physician replies to a series of questions which, when put by an experienced trial attorney, may modify, twist and distort the true medical story.

Except for an initial pilot plan pioneered by the Los Angeles County Medical and Bar Associations in the early 1950's, there was little or no attempt to solve the problem of expert advice and testimony in the field of medical malpractice for the plaintiff. Here the natural disinclination for the physician to testify is compounded by the fact that he must advise and testify against a colleague—a fellow physician—whom he may see week in and week out. Such reluctance is natural and understandable.

As a result of the 1955 meeting of the California State Bar, a committee was appointed to study the problem of obtaining evidence in malpractice cases. Initially, meetings were held with representatives of the California Medical Association to explore the situation, after which the Board of Governors of the California State Bar and the Council of the California Medical Association appointed comparable committees to meet in joint session to formulate a plan which would make available to attorneys the services of qualified physicians to advise on cases of alleged malpractice and, if suit were instituted, to testify as an expert witness. In September of 1957, these committees recommended to their respective parent organizations a plan, which was approved by both organizations.

Here is how the California plan works. First, you must realize that this panel of physicians does not meet or advise in joint session. This panel is essentially a list of qualified physicians from which an attorney may draw a physician of his own choice, who then becomes his medical advisor in the case, and goes to court to testify if the attorney wishes him to do so.

In three of the major metropolitan areas within California—Los Angeles, San Diego, and San Francisco, the local medical societies have set up a panel of physicians representing the fields of general practice, internal medicine, surgery, obstetrics and gynecology, pediatrics, pathology and radiology. Additional specialities may be set up by each society as it considers appropriate. All physician members of the panel attend indoctrination lectures presented by the local bar association. Panel appointments are for one year, but the same physicians are eligible year after year.

After election of the panel and its indoctrination, the panel is administered by a designated officer of the local county bar association.

A panel member is called for duty by the complainant attorney's request in writing. The physician then notifies his county medical society and the local bar association in writing of the requested consultation, giving name of attorney, complainant, and physician complained against. Depending upon the individual case, the physician may decide to review only pertinent records, or he may also examine the patient. He then submits his report *in writing* to the patient's attorney. In the event the case goes to trial, the physician panel member is obligated to testify in court.

No reference may be made in court to the panel or the medical or bar association's participation therein. Judges are requested to adopt the rule forbidding counsel on each side to mention the status of the witness in relation to the panel.

In the event the patient's attorney is not satisfied with the report of the first panel physician, he may secure an examination or consultation with a second member of the overall panel, providing he and his client waive the confidential nature of the first examination or consultation so that the first physician may be examined in any civil action based on the complaint involved. In addition, it should be noted that a second member of the panel may be secured by the plaintiff's attorney without being required to waive the confidential nature of the first examination or consultation, providing the initial panel physician reports in writing to the administrative officer of the local county bar association that the complaint is not within his area of practice or that a second examination or consultation is necessary or advisable for the stated cause.

The physician receives the reasonable value of his time for his consultation and examination, review of records, preparation of report, and testimony in accordance with either the prevailing fees in his community, or as set by fee schedule by the county medical association for this specific purpose.

A panel physician is disqualified if (1) he has treated or is treating the patient or has been consulted by representatives of the physician, (2) there are personal or other relations with the patient which might prejudice the physician's opinion, (3) there is a business or personal relationship between the panel physician and the defendant physician which would make it impossible to render an impartial opinion, (4) the medical problem is not within the field of practice of the panel physician, and (5) the nature of the case or other commitments which would make it impossible for the physician to devote the time necessary for a full study of the case.

To reiterate the basic principle of the California plan, this plan furnishes a medical expert to advise the attorney for the patient and to testify in court if necessary. In this plan, the panel does not meet as a group; there is strictly an advisory relationship between the complainant's attorney and the panel physician.

It is still too early to determine the degree to which this plan will be successful, but I believe it does indicate to judges and to attorneys that organized medicine is meeting its responsibility for justice. It should certainly answer the plaintiff attorney's charge of "conspiracy of silence."

Now, I hope I haven't bored you with this description of what is being done in California to meet the malpractice threat. There is much more, particularly directed toward the elevation of the standard of care and the education of the physician in medicolegal matters that I could tell you about, but time simply does not permit. But I hope you have been impressed with what a courageous medical society, such as the California Medical Association, has done to meet its responsibilities to the public. I am proud to have been one of its members for 13 years.

The Impartial Medical Panel

**By Alfred Julien, Attorney, Harry Sherman, M.D.,
Honorable Aron Steuer, and Preston Wade, M.D.**

Connecticut Medicine *is pleased to present the introductory remarks of four participants of the symposium sponsored by the Conference Committee of the Connecticut Bar Association and the Connecticut State Medical Society.*

Panelist Alfred Julien, Esq., Attorney

■ I am unequivocally against the Impartial Medical Plan. However, I wish to make it plain at the very outset that I ascribe the highest of motives to the men who espoused it. Their objectives were credible. The Plan is unworkable and dangerously impinges upon the basic right to trial by jury.

An Impartial Medical Plan or any kind of impartial plan carries with it the infirmity concomitant with the word, "impartial." What doctor is or could ever be truly impartial? He has honesty, he has integrity, and this is true of the greater part of the profession, but impartiality is to be equated with the blackboard upon which no one has yet written—bare, clean and unconditioned.

No doctor, no lawyer enters into the discharge of his professional duties unconditioned. Many things have a priori effect on judgment: his learning, his school or the professional school which he attended, his conservatism, his liberalism; in short, his entire life up to the point where he is asked to make a valued judgment.

There are doctors who do not believe in the permanency of any part of a concussional syndrome. To them a concussion is a purely transient affair. Others believe there can be permanency. There are physicians who will not accept heart trauma by causation or aggravation without direct injury. Others, equally capable, will accept such causation.

A school of thought insists that myleography is a sine qua non before the diagnosis of an herniated disc is acceptable. Another school of thought considers the myleogram a dangerous procedure. The connection between the aggravation of a multiple sclerosis or cancer by trauma will be certified to by only a small segment of the medical profession. This group may be the most advanced on these troublesome issues. The overwhelming percentage of the medical profession refuses such connection.

In the alleged Impartial Medical Plan, the experts rotate. The expert assigned to a case depends upon who is next in line. Overwhelmingly, they tend towards conservatism since they are generally the older members of the profession or those well advanced in the hierarchy of the medical associations.

Thus, the outcome of a medical decision depends upon the luck of the draw. Who is next? Who is on the list?

If there were two real cases with precisely the same facts and if there were some way where they could be tried in two courtrooms, one alongside each other, can you visualize that two "impartial" men might be simultaneously expressing opinions completely divergent on the same cases at the same time, solely because of this great lottery which s lected one for client "A" and another for client "B". Are we to play this game of Russian roulette with our clients?

The Impartial Medical Plan is a search for certainty in an area where there can be none. Scientific medicine is not exact medicine. The IBM machine cannot practice medicine. We just cannot achieve instant medical certainty by pushing some brightly contrived button.

Yet, every time an impartial medical expert is asked to serve, the court and jury are being asked to accept an opinion clothed with certainty be-

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cause of the alleged expertise of the man who is supposed to know all of the answers. A medical slide rule for finding exact answers has thus been manufactured. There is the appearance of certainty but not factual certainty.

Jessel, Judge in Equity, Master of the Rolls in England, once said, "I may be wrong, I frequently am, but I seldom doubt."

What, however, is the effect upon the jury? Contemplate a jury of twelve listening to disputed medical opinions given, first, by the plaintiff's doctor who may have treated the patient for years and then controverted by the defendant's doctor, who may have examined a few times. Additional time and expense is then consumed while the sacred authority, the court's own specialist, is presented to the jury. In effect, the jury is told:

> "You have heard the plaintiff's doctor, you have heard the defendant's doctor, you don't know which one to accept, but here is your man, the court's own doctor."
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> Mr. Justice Steuer on one occasion said:
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> "The practical effect is to transfer the power of decision in at least a branch of the case from the jury to the doctor."

I am not so much concerned with the impartial medical specialist on the pre-trial level. As a matter of fact, within myself I feel no real opposition to that part of the plan. It is the trial part of the plan which in effect segmentizes the jury trial and takes a part of it away and says, "Gentlemen of the jury, take this decision; this is your answer to what is troubling you on the medical causation," which I oppose.

This mechanistic type of adjudication will, if allowed to continue, in times spread to other fields of expertise. There will be an impartial automobile mechanic, the impartial engineer, the impartial floor waxer, the impartial bottle opener, and the impartial automobile driver. It all lends itself to the same type of treatment. All of it takes away the jury's responsibility and limits the ambit of its authority.

One of my associates once came to me with a vexing problem. His brother was confined to the hospital with a lung injury which had happened spontaneously. There was no lawsuit. There was no claim of accident and the doctors who were called thereafter could not be charged with the taint of partisanship. X-rays were taken. A chest specialist was called and, believe me, his qualifications were great. He said, "We had better have an immediate operation in this case, the case requires it." "Look at these x-rays, there must be an operation." Well, the family was not content, they called a second specialist, and the second specialist looked at precisely the same x-rays, if you will, and said, "There is no lung congestion at all, no need to operate." They called a third expert and he said, "It's a cyst but we don't have to touch it now," and finally they called in an expert from the hospital where the patient was then confined and he looked at the x-rays and he said, "I can't give you an opinion at all. We had better wait." Four excellent men, any one of them a fitting candidate for any medical panel. My young friend came to me and said, "What shall we do?" But for the tragedy involved in the situation, I would have been inclined to say to him, "You want to be certain, you want to be sure, send it to the Impartial Medical Panel." You will have a certain answer; it may not be right, but at least it will be certain.

A friend of mine, Craig Spangenberg, a lawyer in Cleveland, Ohio, had a case involving a back injury which had been operated upon. They were not so much interested at the early stage of the case in the question of testimony, they wanted the man helped and they sent him to one expert. "He is suffering," said the doctor, "from a mild radiculitis." Expert number two: "Oh, no, he has a ruptured disc." He sent him to expert number three. "Why, it is easy, lumbo-sacral instability," so they sent him to expert number four. He said, "The fusion has not taken and it has resulted in a pseudo arthritis. He has to be operated on again." Send him to expert number five. "He should not be operated on for a pelvic fusion unless the surgeon was prepared to go underneath the old graft and expose the disc, because he really did not have a disc in the first place." Two x-ray men. One said the fusion was good, one said the fusion was bad. To complicate the matter, eight days after the operation he has a mild cardial infarction. Expert number eight said, "That happened because of the operation." Expert number nine said, "Oh, no, it didn't." And so we go on and on. This is for treatment, for treatment, mind you.

They were all expert men, all men of genuine integrity, competent, intelligent, meaning to do a good job, and not because of their own limitations were they unable to find the answer, but because medicine itself does not have exact answers. Since medicine does not have exact answers, no impartial medical panelist should be presented to a jury as the Delhi oracle.

The Plan is not accomplishing its intended objective, which was actually to bring about settlements and thereby aid in relieving calendar congestion. The plain fact is that it has not done this at all. Percentagewise the cases going through the Impartial Medical Plan are settled no more frequently than those which do not.

The Plan has had very limited acceptance. New York State, which has 62 counties, employs the

Plan in but two and even there in something approximating 5 per cent of the cases litigated in the two counties. None of the other counties has seen fit to adopt the Plan. I am told that in Baltimore only one judge of nine employs the Plan and that the City Bar Association is on record against it.

In any area other than large municipalities the system would be unworkable. There are few enough experts in these lesser communities as it is and since the Plan allegedly employs those doctors who do not get into litigation with any frequency, the few experts available, by reason of their participation in the Plan, would make it impossible for litigants to secure their service. Thus, those communities would have no physicians to service medical-legal problems.

I would like to read to you what two well known trial lawyers have said about the possibility of cross-examining the sacred cow, as they call it. Says Harry Gair of New York: "If the basic premise for the proposed panel is accepted, that divergent and conflicting opinion evidence is an evil to be exorcised, then cross-examination, if successful, has produced the very confusion which the supporters of the Impartial Medical Panel seek to avoid by branding plaintiff's and defendants' doctors as partisan." Still quoting: "Assume for a moment you are willing to cross-examine. What then? There is a paradox for you. Will the law stand by and allow its anointed pillar of light, the impartial panelist, to be overthrown?"

And, at a seminar like this, when Emile Berman was asked: "Well, isn't it good enough that you can cross-examine?" answered, "I believe that view is entirely unrealistic. Any trial lawyer can readily visualize the persuasive effect of a witness with the courtroom status of a panel expert. Cross-examination indeed! For myself and I fear for some of you almost consummate effort will be far lacking in the kind of skill that will be needed in that kind of a jury trial." Of course, this is true. If a jury has been told that this is the man whom the court selected to get the answer, just think of the way they would look at the lawyer who starts to cross-examine.

Well, you may think it is just the lawyers who say this. Judges who have written on this subject, too. Some of their *recorded* views appear in the 1956 Edition of The Impartial Medical Panel. One judge said he disapproved of the medical expert testimony project because it tended to clothe the impartial medical expert with an invisible robe, allowing him to usurp the function of the judge and jury. He was afraid that the jurors would give undue weight to the testimony of the impartial expert. Another judge quoted in the book which the Impartial Medical Plan put out, said: "My notion is that there should be a stipulation between counsel with the approval of the judge that no person acting as such an expert could be called by either side as a witness at the trial. When such a man becomes a witness in an actual trial he is necessarily stamped as the court's witness and sanctity in that sense is given to his testimony, and it should not obtain in any instance in that fashion where he contradicts the testimony of other doctors called by the plaintiff or defendant. All witnesses should be required to meet the same tests as to credibility and no one should have the stamp of credibility placed on him in advance because he is characterized as the court's witness.

Of course, some of the doctors love the Impartial Medical Plan. They like it because they have always resented our cross-examination. You may remember four years ago Dr. Emil Selitz, who was then the President of the American College of Surgeons, made the front pages of the newspapers. He said that lawyers were unfair to doctors in their cross-examination, they were examining them improperly, and that the doctors would have to be alerted to take care of this problem. There are many doctors who feel that for an expert to be examined within his own specialty by a non-specialist is unfair, holds him up to ridicule and is an improper procedure. Therefore, of course, they welcome being members of an Impartial Medical Panel. Now they are protected with an additional layer of insulation against the type of cross-examination that every litigant in this country is entitled to.

I have been impressed by what Joseph Stetler has had to say on this very subject. Stetler was the Director of the Law Division of the American Medical Association. Says Mr. Stetler: "No reputable physician accepts as scientific truth the first reports on new methods of diagnosis or treatment. He demands that the results of experiments be checked, re-checked and examined critically. Yet the same physician when vigorously examined and cross-examined by counsel even in the course of investigation or in the course of trial, considers it a personal affront. All too many physicians continue to resent incisive examination."

In the same speech Mr. Stetler, speaking before the American Bar Association, said: "I personally would hate to see impartial medical testimony seized upon by members of the medical profession as an avenue of escape for physicians from their responsibility as medical witnesses, all in the hopes that the system will provide a degree of protection from cross-examination." He said further: "I think it is right and proper for doctors to disagree regarding diagnosis and therapy, providing the facts upon which each opinion is based are thoroughly known. It would be unfortunate indeed if uniformity of medical judgment were to be imposed upon us. The creation of a Medical Impartial Panel is of a piece with what may happen when medical certainty where it does not exist is imposed upon our jurors."

Doctors feel that jurymen, being ordinary citizens, are not equipped to handle these difficult problems, but Judge Steuer's own court once said in the case of Nappi against Falcon Truck: "Jurors are neither lawless nor are they corrupt. By and large they are intelligent, just and fair, and it is reasonable to conclude that as they have not left behind their common sense and sound judgment."

Well, they have common sense and sound judgment in their everyday affairs when medical problems arise, too. A fellow needs an operation or thinks he needs an operation, he consults a doctor, not a doctor selected by rotation or by lottery, but his own choice. The doctor says: "You need an operation." Well, he decides, "I would like to get another opinion." He is a layman, mind you, and he goes to another man and this doctor may say, "You don't need an operation." The layman makes up his mind for himself after having examined both sides of the controversy. Are our jurymen less qualified to hear both sides of the controversy and make up their minds as to where the truth lies in these problems? Let's restore our faith in the jury system. Let's restore our faith in the adversary system to which all of us are devoted.

A great writer recently wrote: "These civil rights which our people have, are not abstract principles, but they are principles which must be forged and reforged daily in the minds of our citizens, and they are reforged daily by each jury trial, which is a small miracle of democracy in action."

To the preservation of that small miracle, let us all dedicate ourselves.

Harry Sherman, M.D.

■ I am opposed to the concept of Impartial Medical Testimony for several reasons. These represent my opinions speaking only as a physician and have relevance only in a medical background. I have purposely left the practical courtroom consideration of this problem to the attorneys on the panel who are far better equipped to discuss them.

1. Impartiality as a concept implies the existence of a mind or of an intelligence which can deduce conclusions from given statements of facts without the influence of extraneous factors which bear only tangentially on the problem. This works well for a calculating machine or in a situation which does not allow of human feelings or of human error. In the practice of medicine, which combines the science of medicine with the art of healing, prejudice and bias must act upon the mind of the physician as they do upon the mind of any other human. He may apply himself most assiduously to reject the conscious prejudices but he cannot possibly filter out feeling and sentiments deep in his unconscious, planted there from his earliest days.

2. Not to pose a dilemma but to continue this thought further, it is my feeling that a conscientious physician is already as impartial as it is possible to be within the frame work of human frailty. Admittedly medicine has no absolutes, few diagnoses that are irreversible, few cures that are guaranteed. But within the framework of what we as physicians know, our investigation of the patient should be performed with the greatest degree of thoroughness and our judgments should be arrived at with a dispassionate logic. Assuming these factors to be operative, the ordinary physician arrives at conclusions which are not greatly at variance with the conclusions reached by other physicians of equal competence and background. In effect, therefore, any competent physician should arrive at impartial conclusions, at least as far as his conscious knowledge is concerned.

3. There are, admittedly, a few doctors who lie on the witness stand. That is to say there are physicains who make statements which they know to be false. I submit that these are not partial medical witnesses—they are liars and should be exposed as such and treated as such. It is my opinion that any physician witness who deliberately makes nonexistant findings, who deliberately omits positive findings, who uses his position as a medical expert to draw invalid conclusions, who performs the numerous chicaneries which we have all seen at one time or another—this doctor and those like him do not belong on the witness stand at all. They also do not belong in the practice of medicine. But it is my belief further that their number is small and sooner or later they stand exposed for what they are and those of us who are active in Medical Legal Practice see their appearances on the witness stand grow fewer and fewer. We cannot and must not assume that all doctors belong to this group. It is my feeling that the overwhelming majority of physicians most emphatically do not belong to this category and should be qualified without any question as impartial medical witnesses.

The very classification of a medical witness as an impartial expert confers upon him a certain God-like quality which gives his medical findings, conclusions, and opinion an odor of sanctity which is a great burden for any individual. We must remember that doctors differ on training all the way from pre-medical through medical school and on to postgraduate study, hospital training, and the continuing medical education which occupies a physician as long as he lives. Differences of opinion concerning any one subject frequently develop between groups of doctors with the proponents of any one given point of view just as honest and just as impartial as those who hold to any other point of view. One of the purposes of medical testimony is to develop these differences when they exist and to allow a jury to reach a conclusion as to which of the conflicting schools of thought is the more valid for any particular case. The nomination of a physician as an impartial expert gives his theories and his conclusions an importance and a preponderance which may not be warranted. Remember, if you will, that doctors like Harvey, Jenner, Semmelweis and Lister, to name only a handful, were all in conflict with medical theories which were held as incontestible by the great impartial experts of their time.

The Honorable Aron Steuer

■ It appears that you have sufficient familiarity with the working of the Impartial Medical Testimony plan and that an exposition of its nature is not needed at this time. Any details that you would like to explore further can be left to the question period. So I intend to devote the time allotted to me to answering the attacks made on the plan, and to show that these are without merit, and even lack sincerity.

The first claim is that no doctor is impartial. To support this assertion it is argued that every doctor has had experiences and schooling which leave him with certain fixed ideas or theories in regard to medicine, with the consequence that he cannot be unbiased in his testimony. Of course, if you mean by "impartial" a mind that meets the subject with no prior influencing experiences, no doctor, no mature man, is ever impartial in any situation. Such experiences are what qualifies him to have an opinion. Our whole legal system rests on determination of facts by people presumably unbiased. But by the definition of impartiality given by Mr. Julien, as representative of those in opposition to the plan, all decisions are made by judges and juries who are tarred with the stain of partiality.

Now, it must be apparent that what we mean by an impartial expert is something quite different from a vacuous mind upon which experience has left no impression. We mean a physician whose testimony is not colored by the fact that he is the hireling of either side to the controversy. Practically every negligence case where there is an issue as to either the cause, extent or prognosis of the injuries presents a spectacle wherein opposing doctors who never treated the patient are called to testify. At best, these doctors are selected because the side calling them knows that as a result of their examinations they entertain views favorable to that side's contention. At worst, these doctors are told what testimony is expected of them, and they give it. By impartial we mean a doctor who is not subject to these influences and whose testimony represents his sincere appraisal of the question presented rather than the glib support of the position or the contention of a party, whatever that contention may be. Whether this degree of impartiality is sufficient is a question I will return to later, in another connection.

The second objection raised to the plan is that it destroys the adversary system. The supporting argument is that when the court informs the jury that the doctor has been selected by the court as an impartial expert, the court says in effect that he is the doctor to be believed and so takes from the jury the decision on that point. This is not true. The jury still has to decide, but I freely admit that the jury's decision will be largely affected by the testimony of the impartial doctor. That is the purpose of the plan. And by no means is it an evil. If the adversary system means that the jury is to reach its conclusions on conflicting testimony as to which they have no background or means of evaluation, then the adversary system has to that extent broken down and will not work—it will not produce results in accordance with the rights of the parties. It means that instead of deciding on the facts of the case the jury will be forced to resort to their impression of the professional witnesses—an impression not supported by any true means of evaluation. By supplying this means, the adversary system is maintained, not destroyed. It is only if the adversary system is regarded as a gamble based on the thespian qualities of the witnesses alone that it can be thought to be impaired. My friends across the table feel that there is a vested interest in ignorance and that when the adversary system tends to preserve that interest it is sacrosanct and should not be touched, even to be improved.

Lastly, we are told that medicine not being an exact science, there are varying views—generally referred to as two schools of thought— and if the impartial doctor entertains one of those views the other side is doomed. The argument is the one I said I would later refer to. It is entirely specious. While any specific problem may result in different answers, this does not imply two different medical theories. The subjects and the fields in which there are different schools of thought are very few and are mostly in the field of therapy, with which law suits of this character are not concerned. If there is a genuine cleavage of opinion, supported on both sides by respectable authority, an impartial doctor would be the first to call attention to it. Actually such a difference in opinion means that the medical profession has not reached reasonable certainty on the issue involved. Perhaps for purposes of treatment or cure it is not necessary. For instance, while there may be absolute agreement on the therapy to be followed in a condition, there is a disagreement as to the cause of the condition. Where there is such disagreement among those whose lives are devoted to such study, the question cannot be answered and neither side can rely on expert testimony, because no honest doctor can have an opinion supported by reasonable certainty. There is no reasonable certainty. In such a case, would it not be the height of absurdity to say to a jury: "These learned men are unable to agree as to the cause of this condition—medical history and experimentation give no definitive answer that the profession is willing to accept. So you tell us. From the depths of your ignorance come up with the answer." The law is not ridiculous. It does not sanction that procedure. So the situation envisaged by my friends is one that cannot arise and is a pure myth. It is allied to the other situation alluded to—where medical science has in the past been in error and the error corrected, often by the work of a genius maligned by his contemporaries. Of course, the medical panel doctor may be wrong if the entire profession is laboring under a misapprehension. But is this misapprehension to be corrected by 12 laymen in a jury box?

These are the arguments raised this afternoon in opposition to the plan. It is your judgment to determine whether they have any validity.

Preston A. Wade, M.D.

■ In recent years, there has been a marked increase in the number of personal injury cases brought to trial and the mere increase in numbers has caused chronic court congestion, particularly in metropolitan areas. This congestion is further increased because of the delay in bringing about a settlement by long drawn out court procedures which result from the presentation of widely conflicting medical opinion evidence by partisan doctors retained by the plaintiff and the defendant.

In various communities in the United States, efforts have been made to use a medical expert panel to provide a reasonable method of obtaining a completely objective medical testimony before the case comes to trial, in an effort to bring about a more equitable and speedy settlement.

New York County Courts were the first to establish such a system and, since this plan has been in effect for the past ten years, I would like to discuss it to illustrate the means of handling the situation.

The adversary system of judicial procedure in the American courts is considered, by many, to be the fairest means of achieving justice. However, the very nature of the adversary system has brought about the unhappy problem of widely divergent medical opinions in personal injury cases. Inasmuch as nearly 7 per cent of all trial litigation involves medical testimony, one can readily see that the physician occupies a major role in the administration of justice. Frequently, the outcome of personal injury litigation depends upon a battle of the experts between opposing medical witnesses.

Many of the better physicians and surgeons are quite unwilling to testify, in personal injury cases, unless they are actually involved in the treatment of the patient. Therefore, the usual medical witness has not always been of the highest caliber and his professional knowledge and ability may be inadequate to serve the best interests of all concerned.

It has been my impression, over the years, that neither the counsel for the plaintiff nor the counsel for the defendant has any idea of seeking the truth, and nothing but the truth, but is only making every effort to win his case. The spectacle of a dishonest colleague, falsely challenging the testimony of another, or giving expert opinion in a field in which he is not qualified, has only helped t make me avoid testifying in court, if at all possible.

As the result of this problem, the responsible members of the medical profession, in New York City, were gratified that the Justices of the Suprem Court saw fit to make an effort to improve this situation and expedite the outcome of personal injury cases. When a special committee of the Association of the Bar of the City of New York made plans to set up a panel of medical experts, the responsible officers of the New York Academy of Medicine and the New York County Medical Society were assigned to choose the panel of experts and found that most of the physicians invited to serve, accepted with enthusiasm and in a spirit of cooperation.

I accepted my invitation to become a member of the panel, with great enthusiasm, because it seemed to me an opportunity to participate in the effort to eliminate some of the bad situations involved in personal injury cases. I must say, I had many reservations concerning the success of the experiment but, over the past ten years, I have found it to be exceedingly satisfactory and I am, indeed, happy that I have had a part in it.

My experience as a member of the panel has been most gratifying. I was surprised to find how all concerned accepted the impartial medical expert without reservation and did everything possible to assist him in arriving at a decision promptly and with little inconvenience.

The member of the panel is usually introduced to the case by a member of the Medical Report Office, who acquaints him with the facts, and indicates the differences of opinion, the particular discrepancies in the medical evidence that necessitate an impartial examination, or specifies some medical point upon which impartial opinion is desired. The physician's office makes the appointment to examine the patient at a time that is mutually convenient. In the meantime, the Medical Report Office makes sure that the attorneys for the plaintiff and the defendant provide the examiner with all the medical data in their possession, including such things as x-rays, photostatic copies of hospital charts, and doctors' reports. The plaintiff is accompanied by his counsel, and, on occasion, an attorney for the defendant also attends. In every instance in which I have been involved, both plaintiff and attorneys were very cooperative and helped in every way to facilitate my examination.

I was able to question the plaintiff, obtain the necessary history, and make the required examination. If I felt it essential to take x-rays in my office, I could do so, and at no time was there any reluctance on the part of the client or his attorney. Consequently, the examinations were always carried out in the most informal and friendly atmosphere.

The report, which is similar to one that I might prepare for a referring physician, is submitted in triplicate to the Medical Report Office. As definitely and specifically as possible, it answers the questions which have led to the discrepancies in the medical testimony previously presented. After reviewing this report, the presiding judge may, if he chooses, call the examiner and informally question him further to clarify points which will help him to make a decision.

There are no set fees for any given time or any given case. In most instances they have been within reason, and only rarely have they been excessive. The policy of the Medical Report Officer is to pay the fee asked by the examining doctor, and if this is considered to be unreasonable, not to invite that panel member to take part in further cases.

It is inevitable that the panel expert will be asked to appear to testify in some of the cases that go on to trial. I have done so several times, and the courtesy extended to me has been gratifying and surprising. I felt that I was truly a "friend of the court," and at no time was my professional standing challenged nor was there any attempt to imply that my testimony was anything but the truth. In most instances, I have been given sufficient notice and have been asked to appear at a convenient time; I have always been paid my usual fee.

I understand from an investigation of the cases examined by the panel experts, that, in many instances, an early settlement has been effected, and frequently, a more equitable settlement than might have resulted if impartial medical testimony had not been requested.

When the special committee on impartial medical testimony sent out a questionnaire to 15 panel members the results indicated that, in their opinion, the selection of specialists was satisfactory; both plaintiff and defendant cooperated and assisted in the examination, and at no time was any pressure of persuasion exerted upon the examiner. Each panel member indicated that adequate time was allowed for the examination and preparation of the report, the office of the Supreme Court was extremely cooperative, understanding, and helpful, and the arrangements for the appearance at the trial were satisfactory. The interrogation by the lawyers on both sides was reasonable and productive, and the testimony was important and decisive in the outcome of the trial. Few had any criticisms of the panel system or suggestions for its improvement. Many of the physicians on the panel commented that they believed it would add greatly to the administration of justice in this type of case, and they were enthusiastically in favor of the system.

Another benefit resulting from the impartial medical testimony program is not mentioned and has received little attention. I refer to the benefits which accrue to the injured individual by reason of an early settlement of his case.

Since we know that by reason of the adoption of the impartial medical testimony program, many cases have been settled in a very short time, saving long periods of litigation, we may then be assured that the suffering of the individual has in some measure been alleviated. Although these benefits cannot be measured in terms of time or dollars, they, nevertheless, represent one of the important advantages of this program.

It is clear from the pilot study that this program is a significant forward step in the development of the system of justice in New York City, and adoption of this program on a national or state-wide basis would be advantageous to all concerned.

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PROPOSED AMENDMENT TO THE BYLAWS

The following proposed amendment to the Bylaws was presented to the House of Delegates on April 30, 1963 and was tabled for consideration and action at the next regular meeting of the House of Delegates.

In accordance with the Bylaws, this amendment will be published in Connecticut Medicine, "on one or more occasions prior to the next meeting . . . at which meeting the amendment shall be taken off the table and acted upon by the House of Delegates."

Introduced by the Council:

ARTICLE IV — MEMBERSHIP — Section 7. Discipline

The Council shall have the power to discipline a member for cause by a two-thirds vote of the members present and voting at any regular meeting or special meeting of the Council called for this purpose. At this meeting the accused member shall have the right to be present and represented by counsel. In its discretion, the Council may evoke for cause the following disciplinary measures against a member:

1. **Reprimand—The privileges of a reprimanded individual suffer no change in status.**
2. **Suspension—A suspended member remains a member of the Society. However, for the period of suspension, he shall lose two privileges only; namely, the right to vote and to hold office.**
3. **Expulsion—An expelled physician immediately loses all privileges and obligations to the Society. The Secretary shall remove his name from the roster of members. After a lapse of one year this physician may apply again for membership.**

Progress Or Only Change?

For several years now, one of our major personal concerns has been some of the planning that's going on to make the hospital "the center of community health services" and the unceasing efforts of certain influential groups to come up with the right formula for applying "leverage" to the outside-the-hospital providers of medical care so as to convert this dream into a reality. Quite apart from the fact that better than 95 per cent of all patients are now being seen by private practitioners in their offices and on other non-institutional premises—a situation the status quo of which ought to be of more than passing self-interest to the man who has successfully established himself and his professional reputation somewhere on Main Street—we find we are at odds with this proposition for at least one other well-considered reason.

In the last decade, we have watched the leaps-and-bounds development of gigantic suburban shopping centers all over the state, and have observed wide public acceptance being given to the so-called "discount" stores—emporia where one can purchase almost everything from a postage stamp to a complete set of bedroom furniture at less (so they advertise) than "regular" prices. One might say, in fact, that these marts and plazas and so on have become the "centers" for a lion's share of community buying of goods and services, and there is no need to make a survey to discover why so many "For Rent" signs are going up in the windows of small, widely dispersed places of business which were formerly owned and operated largely

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as one-man enterprises. So among individual retail merchants, at least, it is clear that the application of proper leverage by big, interstate combines has been most effective in hastening their disappearance from the local scene.

As we said, the public seems to have accepted this transition pretty well. Occasionally, though, we hear an acquaintance of ours expressing rather bitter criticism of the treatment he claims to have received at one of these collosal supermarkets, especially when an item he bought there didn't at all measure up to expectations and he tried to get his money refunded. "They just keep sending you back and forth from one desk to another!," he's likely to complain, "Nobody apparently wants to take the responsibility for making good on the deal, and the head man never seems to be around. It's enough to try the patience of Job!"

For a brief period during the early and less secure days of our career in medicine (Remember the depression?) we were employed briefly at a large metropolitan hospital and did our best to measure up to the impressive title of "Admitting Physician to the Private Outpatient Department." While there, we had an experience that reminds us a little of the kind of problem our friends seem to be encountering currently at the big, everything-under-one-roof shopping centers. One day, a very pleasant middle-aged lady presented herself for enrollment at the clinic and, after hurdling the initial obstacle of having to wait nearly two months for her first appointment, she became a regular customer of the so-called "pay" section. For some strange reason, she grew to look upon us as a sort of personal friend and when she made her frequent visits—sometimes two and three a week—she stopped quite regularly at our desk to pass the time of day and to tell us over and over again how beautiful the building was and how nice everybody was and (especially!) how *thorough* the examinations were. "They certainly took a good look at my tonsils and adenoids this afternoon!," she'd say to us, on her way out, or: "Those people up there in Orthopedics aren't likely to miss a trick, the way they poke and prod around!"

That's the way things went for her—all peaches and cream—until a couple of months had gone by. But then, on a rather dismal rainy day in February, we noticed that her step was a little heavy as she headed for the exit and that she didn't seem to be her usual chipper self. "What's the matter, young lady?," we called out, "Weather got you down, or did they finally find something really the matter with you?"

"Neither," she answered, coming over to our station, "It's just that I'm puzzled, that's all. You know how wonderful I think this place is—I've told you often enough!—but there's a thing that's bothering me and I don't know who to go to for the answer. What's more, I'm almost ashamed to ask."

"Why, you can inquire right here!," we volunteered, thinking to be of service, "What's on your mind?"

"Well, sir," she blurted out, dabbing at her eyes with her handkerchief, "I've been seen by at least ten different doctors since I've been coming here for my checkup, and my trouble is that I simply don't know which one is mine! Could *you* tell me?"

We recall that we felt pretty awful to have to admit we couldn't pick out for her the one from among the many—we just didn't have the facts, and it pained us a good deal that she walked away without saying another word. We never did see her again, because we left our salaried post soon after, but we've never forgotten the object lesson she taught us – albeit inadvertently. Her enigma, of course, did nothing to detract from our admiration of hospitals themselves. Then, as now, we recognized and appreciated the vital role they play in maintaining and restoring health among the people of the communities they serve.

But the thing that *did* impress us deeply was the importance she placed on having a personal patient-physician relationship—a source of comfort which had somehow eluded her at the clinic. In our opinion, the private practitioner of medicine is still in the best position of anyone to furnish this "secret ingredient" to the public, and it therefore remains our firm conviction that he can continue to do the most good for the greatest number—as he is doing now—if only he will dispense it as generously as he should.

W.R.R.

Sugar And Spice Alone?

Every so often someone gives us a pat on the back for our efforts toward fighting off socialized medicine in America, and tells us we're going to come out all right in the seemingly endless struggle if only we'll take our case to "the people" and give the public "the facts."

"Why, the politicians would never dare to pass any King-Anderson Bill," they assure us, "if voters are once told the truth by their doctors and everyone gets to understand what it's all about!"

This kind of moral support is certainly nice to come by, especially when we're feeling a little tired and discouraged, and we *are* doing our best to see that the public is informed on the "medicare" question. But, lately, we're finding cause to wonder just who "the public" our friends talk about really is and how receptive the masses are to the sound argument and the light of reason.

For instance, we just heard on the radio today that 21,000 (out of 40,000) unionized teachers in New York's secondary school system have promised to strike if their demands are not met by the city administration, intend to picket (which is prohibited by law), and, if an injunction is issued to forbid them to stay off their jobs, will brazenly ignore the order of the court.

Not only that, more than 100,000 municipal employees in other branches of service have pledged themselves to stop work to demonstrate their "sympathy" with the teachers' position. We're surely glad we don't have to stand in Mayor Wagner's shoes on a political "hot potato" like this one. No matter how you look at it, the combination of union pressures hasn't given him much room to wheel and deal in—not with powerful threats like those!

Now we must confess that we can't quite imagine a determined band of protesting practitioners chaining themselves together and blocking the entrance to the emergency room at their local hospital, nor would we really expect our friends in pharmacy to close up shop (if the chips were down) in sympathy with our cause. We guess professional people in medicine just couldn't bring themselves to take part in activities like those in order to make a point. But if the New York teachers and their supporters (130,000 strong) can be looked on as a representative segment of "the public" we're supposed to win over solely with the soundness of our logic and the persuasiveness of our words, maybe our sympathetic friends are giving us a bit of a bum steer. Maybe most of these "angry men" who are now telling off the city fathers in no uncertain terms don't speak quite the same language we do. Maybe they'd be able to hear a lot better if we'd get away from calmly presenting "the facts" every once in a while and spent some of our time in talking turkey.

W.R.R.

Toward A Fuller Understanding

The other day we were looking through a news magazine put out by one of the largest county medical associations in the mid-West and were most interested in the letter-to-the-Editor comments of a member on the subject of apathy among physicians toward the activities of their professional organizations—a subject which had been dealt with in an earlier issue by the association's president.

Obviously not in complete sympathy with the top officer's views, the critical dues-payer charged that his county society is not "doing anything to attempt to carry out the wishes of the majority of members on the subject of Social Security (a poll apparently having indicated that a majority favor the inclusion of M.D.'s)," and also demanded to know what steps the leadership is taking "to defend the non-participating physician (in Blue Shield) who refuses to be regimented." In conclusion, he wonders if the member is not pretty much a "forgotten man."

For a couple of decades now, the severer critics of OASDI have been asking what seems (to us) like a rather pertinent question. "If it's so good for everyone and so much of a bargain," they inquire, "why does it have to be compulsory?" To our knowledge, however, their question is very seldom answered satisfactorily—seldom, that is, unless one is willing to accept explanations like: "It takes a little compulsion to make freedom work," which is the enlightening reply a prominent New York State politician frequently uses to silence any hecklers who confront him on this matter.

In any case, it appears to us that the physician who wrote the critical letter we're talking about has gotten his metaphors or something just a mite mixed up. On the one hand, he beseeches his medical society to save him and his colleagues from being regimented under a voluntary health insurance plan and, on the other, to push for their universal conscription into the ranks of those who are already required to pay Social Security taxes—whether they want to or not. Evidently the good doctor doesn't realize that the very nature of "social" insurance demands that an all-or-none law be enforced, and that freedom of the individual to make his own choice as to participation plays no part whatever in the Federal scheme of things.

W.R.R.

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Are We Neglecting Water And Potassium In Cardiovascular Therapy?

By Louis H. Nahum, M.D.

■ Physicians are at times faced with edematous patients of cardiac origin who are refractory to all types of generally accepted medical and surgical therapy. This even after the correct use of low sodium diets and diuretics and digitalis. The improvements that may be derived from the use of water has recently been reported by Resano-Perez[1] and the combination of water and Potassium by Sodi-Pollares.[3] These studies have raised anew the question of how much water may be allowed to cardiac patients.

At one time water restriction was a popular method of dealing with cardiac edema. But this turned out to be both inhuman and often ineffective. A number of years ago Schemm[2] advocated the use of large amounts of water up to five liters in the treatment of cardiac edema but this method fell into disuse first because large quantities are unpalatable, second because some patients were rendered worse because of the development of "dilutional hyponatremia" and third because the introduction of powerful diuretics rendered it unnecessary to pay too much attention to the water intake. At present the majority of physicians probably permit cardiac failure cases to take liquids ad libitum. But in such a case, water intake becomes a variable quantity and is dependent on the sensation of thirst, on the patients habits, and environment circumstances, and as is known appetite for water may even be depressed because of cardiac failure. If we forget about the role of water in diuresis and act permissively the patient could find himself imbibing much less than the minimum requirements for the optimal excretion of the retained sodium and water. Several studies are now available which have demonstrated that the volume of liquid intake is very important in diuresis during a low-sodium regimen and if we depend upon the patients own appetite for water to determine his water imbibition we may be losing a valuable adjunct in the treatment of patients with cardiovascular disease. Resano's findings are important in this regard. He studied a group of 26 cardiac patients in great detail. If the intake of water was kept at levels of 1500 to 2000 m.L. then the intake and output were approximately equal. However, on 2500 m.L. the patients achieved a diuresis of 3000 m.L. Output exceeded intake by 500 m.L. What is equally significant is that no case of "dilution syndrome" developed on this daily water intake. Clearly permissiveness in the use of water by cardiac patients denies them an important diuretic agent water. The same permissiveness in the use of water which deprives cardiac cases of an important diuretic is also true as regards potassium intake even though accumulated evidence supports the thesis that potassium deficits may, and frequently do, occur in vigorous treatment of edema of cardiac origin. In cardiac failure there frequently occurs an intracellular deficit of potassium even at a time when the serum potassium levels appear normal. Furthermore this intracellular deficit in heart muscle is frought with serious consequences and as Selye's[4] experiment suggest potassium is needed and can exert a "protective role" on the myocardium. Part of the potassium deficit is due to poor nutrition, increased intracellular water and sodium, digitalis, and most especially the vigorous use of saluretic drugs which now is an important part of therapy in every cardiac patient with edema and hypertension.

What then may be expected if due attention is paid to amounts of water ordered and potassium supplements given to patients with heart failure, hypertension and angina pectoris. A recent report by Sodi-Pallares et al[3] based on several years experience with a large group of patients in whom careful attention was paid to water and supplementary use of potassium is of considerable interest. The

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DR. LOUIS H. NAHUM is a Lecturer in Physiology, Yale University School of Medicine, New Haven. Consultant in Medicine Grace-New Haven Community Hospital, New Haven. Hospital of St. Raphael, New Haven. Griffin Hospital, Derby. Middlesex Hospital Middletown. Cardiologist at Milford Hospital, Milford.

authors evolved a regime no different from the accustomed one of sodium restriction and adequate protein intake, but in addition water was prescribed in amounts averaging between 2500 to 3000 m.L. as natural water and potassium chloride of 1.5-3 grams was given in divided doses. The amount of potassium given was intended to maintain serum potassium levels above 4.2 mEq. per liter. The authors believe that levels around 3.7 mEq. per liter may represent in cardiac patients a state of hypopotassemia. The authors reported "surprising and gratifying success" in hypertension, angina pectoris, chronic cor pulmonale. What is most surprising is that the success continued even after diuretics, digitalis and various hypotensive agents were reduced or even discontinued. The improvement in the patients weight and feeling of well being was especially striking evidence of the success of the method. It would appear that water and potassium are of more value in treating cardiac failure, hypertension and angina pectoris than is commonly realized. The benefits certainly can be easily checked by almost any physician who deals with general medical cases. There is of course some art involved in titrating the amount of water needed to achieve diuresis but this is readily acquired if one is acquainted with some of the reasons for seeming failure in some of Sodi-Pollares patients. The fundamental points on the regime are (1) high natural water intake, (2) salt restriction to 500 to 1000 mg. Sodium, (3) a well balanced diet, (4) saluretic drugs, (5) Potassium supplements of 0.5 to 1.0 grams t.i.d. (6) Prednisone in refractory heart failure and hypotension, and (7) careful watch to avoid hyponatremia.

Dr. Sodi-Pollares mentions some of the difficulties encountered in carrying out his regime. Very often as a patient improves he spontaneously diminishes his water intake. This has to be checked and watched. Many patients forget to avoid some sodium rich food, so that a review of the diet on each visit is important. Chlorothiazide is less effective if there is not also a high water intake. If patients complain of weakness because of reduced sodium blood levels then salt intake should be raised somewhat and chlorothiazide dosage reduced.

The thesis that sodium restriction is not enough and that in the majority of cases administration of potassium and large amounts of water may also be necessary is one for us all to keep in mind. The concept that water should be regarded as a drug to be taken in specified required doses is a valuable one. The idea that a relationship exists between cardiac insufficiency, electrolyte status of the myocardium and the coronary tree is also a fruitful one.

Our knowledge of the basic mechanisms involved in the success of this program is limited as is the knowledge in many areas of cardiovascular physiopathology. Further work is needed, both clinical and experimental, to clarify and qualify our concepts. Practically, however, the physician has come into possession of valuable adjuncts in the treatment of patients suffering from heart failure, hypertension and angina pectoris.

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Where there is love of man, there is also love of the art, for some patients, though conscious that their condition is perilous, recover their health simply through the contentment with the goodness of the physician—Hippocrates

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Around The State

New Haven County

Dr. Sidney Licht, assistant clinical professor of physical medicine and rehabilitation of the Yale University Medical School, was named 4th vice president of the Congress of Physical Medicine and Rehabilitation at the group's 41st annual meeting held recently in Dallas, Texas.

Operation Summer Replacement

Thousands of teenagers did a grown-up job this summer as non-paid volunteers at the Veterans Administration's hospitals nationwide.

Serving as high school volunteers, they were engaged in "Operation Summer Replacement," to fill the gaps left at the VA hospitals by absence of older volunteers on vacation.

For many of the young people, the VA service provided valuable experience toward their life work goals. The teenagers often developed interest in careers in medicine, nursing, and related fields.

With both patients and staff members, the juniors are an unqualified success.

Both boys and girls worked in pharmacy, dietetics, dental service, hospital libraries, educational therapy activities, hospital recreation and radio programs, and in escort service taking disabled veterans to and from clinics and therapy rooms.

They also shopped and wrote letters for patients and did errands such as delivering books and flowers to wards.

The high school volunteers usually spent one day a week at the VA hospitals, but many turned up for additional duty.

The minimum age for volunteers at most of the hospitals is 15. Those 16 and older do most of the tasks performed by their adult counterparts. The younger volunteers are limited to tasks not involving direct contact with patients.

Recipients Named for Writing Fellowship Award

The extensive and enthusiastic response to the announcement of the W. B. Saunders 75th Anniversary Writing Fellowship has resulted in the awarding of two grants instead of the previously announced single award.

So many outsanding applications were received by the Selection Board from medical scientists of distinguished accomplishment, that an Executive Committee consisting of Robert F. Loeb, Rene J. Dubos, Henry Allen Moe, and Robert S. Morison recommended to the Saunders Company that it mark its anniversary with two equal fellowships, each in the amount of $15,000.

Saunders accepted this recommendation and announces that the two recipients chosen by the eminent selection board are Dr. Herman M. Kalckar, of Harvard Medical School, and Dr. Paul B. Beeson, of Yale University School of Medicine.

Dr. Kalckar will be writing on Biological Patterns of Cells in Developmental Defects and Disease States.

Dr. Beeson will be writing on Associations of Specific Infections with Certain Disease States of Man.

Formal presentation of the awards will be made individually to each grantee at two dinners to be held in the Fall and early Winter.

Doctor's Office

Joseph A. Amato, M.D., announces the opening of an office for the practice of internal medicine and diseases of the kidney at 283 Collins Street, Hartford.

Henry J. Cutler, M.D., announces the opening of an office for the practice of internal medicine at 9 Cooke Street, Waterbury.

Arne S. Levinson, M.D., announces the opening of an office for the practice of dermatology at 153 East Avenue, Norwalk.

A. Gerard Mack, M.D., announces the removal of his office from 881 Lafayette Street to 114 State Street, Bridgeport.

Frank G. Marx, M.D., announces the opening of an office in association with Herbert R. Kuhn, M.D., for the practice of obstetrics and gynecology at 464 Ocean Avenue, New London.

Francesco P. Moreschi, M.D., announces the opening of an office for the general practice of medicine at 118 Colony Street, Meriden.

Paul S. Norman, M.D., announces the opening of an office for the practice of medicine, specializing in the treatment of ear, nose and throat at 320 Main Street, Manchester.

A. Craig Shealy, M.D., announces the opening of an office for the general practice of medicine at Bridgewater in addition to his office in Woodbury.

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MANAGERIAL STRESS NOT LINKED TO CORONARY DISEASE

A heavy load of responsibility at the office apparently does not make top-management executives more prone to coronary disease, a study indicated recently.

Among personnel of a large industrial firm, it was found that the heart attack rate of presidents, vice presidents and plant managers was 2.2 per 1,000 compared with 4.0 per 1,000 among clerical workers.

The study was reported by Sidney Pell, Ph.D., and C. Anthony D'Alonzo, M.D., Wilmington, Del., in the current Journal of the American Medical Association.

"Stress cannot be measured or described by the external circumstances with which a person must contend, but rather by his reaction to these circumstances," the researchers concluded. "One man's stress may be another man's pleasure."

"Thus the demands of a top-management job may be no more stressful than situations commonly encountered by persons in lower job levels, at work and at home. Secondly, men chosen for advancement may be those whose personal qualities are characteristic of both executive talent and resistance to coronary disease. It is conceivable, for example, that, in selecting persons to assume greater responsibilities, supervisors and managers, knowingly or unknowingly, may tend to choose the better adjusted individuals, who by virtue of their personality and psychic state are better able to cope with life's stresses in general."

The researchers also studied the heart attack rate with regard to high blood pressure and obesity, drawing the following conclusions:

- High blood pressure increases the risk of heart attack in all age groups studied, especially in men under 45.
- Overweight is not associated with heart attacks between the ages of 45 and 64.
- Under 45 years of age, both conditions appear to increase the risk of heart attack, particularly when they occur jointly.

In men under 45 who are both hypertensive and overweight, they said, the estimated incidence of a heart attack is five times that of men with neither of these conditions.

The study also revealed the well-known increase in the heart attack risk with age and the much higher risk in men than in women.

The six-year study, conducted among employees of E. I. du Pont de Nemours and Co., Inc., confirmed the findings reported after the first three years of the investigation.

Letters To The Editor

To the Editor,

It was with considerable interest that a recent editorial of yours on tetanus antitoxin was read and discussed by our staff.

Interest has been so stimulated that several physicians have asked me to find someone in Connecticut who is abreast of current ideas in the field and who would be able to talk to our physicians on the problem.

I am taking the liberty of writing to you for your advice and any opinions you might have.

Thank you.

Sincerely yours,
Martin Duke, M.D.

Manchester, Conn.

To the Editor,

Je suis très fatigué at the end of a long day but I must tell you how much I enjoyed the lead editorial, "The Process of Socialization And Its Meaning To The Human Race" in the September issue of the Journal.

I doubt if I have ever read so much in so few words and to borrow something from my father's rusty French, "It gave me furiously to think." I shall see that it gets some attention at the local V.A. clinic where I spend twenty-five hours a week.

Sincerely,
Daniel P. Griffin, M.D.

Bridgeport, Conn.

To the Editor,

The editorial "Science Tools: (2) The Thermogram," has been read and only approval can be expressed. However, we would like to revise and extend your editorial to bring the data up-to-date.

Thermography is clinically on trial, in addition to Albert Einstein Medical Center, Northern Division, Philadelphia, at the Neurological Institute, Memorial Hospital and St. Vincent's Hospital, all in New York City; Beth-El Hospital, Brooklyn, N. Y.; the Winsor Foundation, Los Angeles, California, and for basic bio-physical studies in the Research Department of Norwalk Hospital, Norwalk, Connecticut. By the end of 1963 we are sure that a large mass of controlled and correlated clinical data will be available to the profession.

Finally, we would like to state that reception of new diagnostic tools by the medical profession can be expedited if more M.D.'s will allow themselves to be "transistorized." The mass of knowledge available for exploitation in the race to raise man to a greater status must be embraced with care. But let us not lose sight of the fact that only through humanitarian impulses and drives will technological breakthroughs such as the Thermograph be accepted. Their use for destruction is becoming passé.

Sincerely yours,
Warren Zeph Lane, M.D.

Norwalk, Conn.

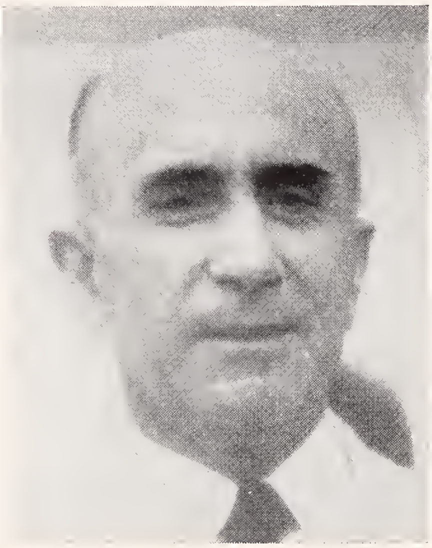
OBITUARY

Constantine A. P. Zariphes, M.D.

1898 - 1963

Dr. Constantine A. P. Zariphes, of 244 Old Main Street, Rocky Hill, died on July 2, 1963, at Hartford Hospital.

He was born in Asia Minor on May 26, 1898 and has been a resident of the Hartford area for thirty-eight years. He was a graduate of the American College of Smyrna, attended Wilbraham Academy, graduated from the Greenwich Academy in Rhode Island, graduated from Bates College and received his M.D. degree from Boston University.



He interned and was resident physician at McCook Memorial Hospital and did post graduate work in surgery at Harvard Medical School. For twenty-five years he was city physician in Hartford.

Dr. Zariphes was on the courtesy staff of Hartford, McCook, St. Francis, and East Hartford Hospitals. He was a member of the American Medical Association and the Connecticut State Medical Society. Also a charter member of St. George Greek Orthodox Church, a member of the American Hellenic Educational Progressive Association, and a trustee of the Open Hearth.

He was a veteran of World War II and served as a major in the Medical Corps in the European Theatre in the Field Hospital in England, France, Belgium, Luxemburg, and Germany where he received two citations.

Dr. Zariphes' medical colleagues have been aware of his years of service to the poor of the City of Hartford. As city physician he made countless fourth and fifth floor walk-up night calls. His years of volunteer work in the medical clinics at the McCook Hospital were heartwarming. His struggle to continue medical practice despite dozens of angina attacks daily was a story of courage. He achieved the cherished ambition of seeing his son graduate from medical school.

He leaves his wife, Mrs. Mary D. Valakis Zariphes; a son, Dr. Constantine A. P. Zariphes, Jr. of Manchester Memorial Hospital, three daughters, Mrs. George Mastras of Fairborne, Ohio, Miss Amelia Artemis Zariphes, and Miss Doretha Katherine Zariphes, both of Rocky Hill; two brothers, Alexander Zariphes of Brighton, Massachusetts and Theodore Zariphes of Clearwater, Florida; two sisters, Mrs. James Gregory and Mrs. Peter Karrides, both of Boston, and two grandchildren.

Lewis A. Giffin, M.D.

In Memoriam

Blass, Gustaf—Stamford; Vienna Medical School, Austria, 1924. Dr. Blass served in World War I. Dr. Blass practiced first in his specialty as a radiologist, before joining the staff of Stamford Hall as assistant medical director 20 years ago. Dr. Blass had been active with the Mental Health Association of Stamford. He was a fellow of the American Psychiatric Association, and a diplomate in psychiatry, of the American Board of Psychiatry and Neurology. Dr. Blass was a member of the Stamford Medical Society, the Fairfield County Medical Society, the Connecticut State Medical Society, the American Medical Association, the New York Academy of Sciences and the Association for the Advancement of Psychotherapy. Dr. Blass died August 6, at the age of 63.

Bernstein, Abraham—Bridgeport: Yale Medical School, 1908. Dr. Bernstein was a member of the Fairfield County Medical Association, the Connecticut State Medical Society, and the American Medical Association. Dr. Bernstein died August 6, at the age of 79.

Bluestone, David A. — Naugatuck; Syracuse Medical School, 1912. Dr. Bluestone was a practicing physician and surgeon in Waterbury for 33 years. He served as a First Lieutenant and as the camp surgeon at Fort Benjamin, Harrison, Indiana, in the Army during World War I. Dr. Bluestone was a member of the Waterbury Medical Association, the Connecticut State Medical Society, the New Haven County Medical Association, the American Medical Association, the American

Legion of Naugatuck, and the Shepard Lodge of Masons. Dr. Bluestone died August 21, at the age of 77.

Close, J. Frederick—Greenwich; Columbia University College of Physicians and Surgeons, 1925. Dr. Close was a pediatrician in Greenwich for 34 years. He was a member of the Greenwich Medical Society, the Fairfield County Medical Association, the Connecticut State Medical Society, and the American Medical Association. He was awarded a fellowship in 1944 to the American Academy of Pediatrics. A veteran of World War I, Dr. Close was a member of the Greenwich Rotary Club. He was active in the North Greenwich Church. Dr. Close died August 11, at the age of 65.

Denne, Thomas H.—West Hartford; University of Vermont, 1905. Dr. Denne was a retired director and superintendent of medicine and hygiene of the Travelers Insurance Company and the Travelers Rest House, West Suffield. Dr. Denne was a former president of the Hartford Medical Society. He was a member of the Hartford County Medical Association, the Connecticut State Medical Society, and the American Medical Association. Dr. Denne died August 30, at the age of 80.

Farrell, John F.— Norwalk; Harvard Medical School, 1953. Dr. Farrell conducted a practice in general surgery in the Norwalk area for five years. During World War II, Dr. Farrell served with the medical corps of the Army. In this capacity he served in the China-Burma-India Theatre for several months before transferring to the Office of Strategic Services where he performed as a medic in the Philippines and China. While at Harvard he was selected to travel to Germany for study of surgical methods in several hospitals there and also to study under Dr. John Olds, the famous Johns Hopkins professor who performed at the Notre Dame Memorial Hospital for more than 20 years. Dr. Farrell was very active in civic affairs. He was a member of the Fairfield County Medical Association, the Connecticut State Medical Society, and the American Medical Association. Dr. Farrell died August 27, at the age of 39.

Weitzel, Edward A.—Manchester; Temple University Medical School, 1952. Dr. Weitzel served as a First Lieutenant in the United States Army Medical Corps from 1953-1955. He was a member of the Hartford County Medical Association, the Connecticut State Medical Society, the American Medical Association, the American Board of Pathology, and the College of American Pathologists. Dr. Weitzel was an associate pathologist at Manchester Memorial Hospital. Dr. Weitzel died August 7, at the age of 35.

1963 MEETINGS

October 13-16—Nurses Conference, sponsored by District I, of the American College of Obstetricians and Gynecologists will be held at the Hotels Statler and Bond, Hartford, Connecticut, from Sunday, October 13th through Wednesday noon, October 16th.

October 16—Fall Travel Meeting, Connecticut Society of American Board Surgeons will be held at Hartford Hospital, 9:00 A.M.

October 16-19—Annual Meeting of District I, of the American College of Obstetricians and Gynecologists will be held at the Hotels Statler and Bond, Hartford, Connecticut, from Wednesday, October 16th through noon on Saturday, October 19th.

October 24—180th Semi-Annual Meeting of the New Haven County Medical Association will be held on Thursday, October 24, 1963 at the Waverly Inn, Cheshire, Connecticut. The Business Meeting is tentatively scheduled for 2:30 P.M.

October 25-26—Regional Meeting of the American College of Physicians, New England States, Quebec and Maritime Provinces, Hotel Statler, Hartford, Connecticut.

November 13-14-15—New England Postgraduate Assembly to be held at Statler Hotel, Boston.

December 4—Annual Meeting of the Connecticut Society of American Board Surgeons, Inc. at Les Shaw's Restaurant, 70 Pond Lily Avenue, New Haven. Scientific Meeting to be held at 3:00 P.M. and dinner to follow.

1964 MEETINGS

May 25-27—Annual Meeting American Thoracic Society Medical Section of the National Tuberculosis Association to be held in New York City.

June 14-19—The VII Interamerican Congress of Cardiology will be held in Montreal, Canada.

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*Schwartz, I. R.:
Current Therap. Res. 3:29, Feb., 1961.

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Auxiliary Workshop

Officers, chairmen, and representatives of the county and state Auxiliary membership met in New Haven on September 9th at an Auxiliary Workshop. The theme "1963 RX—Serve and Communicate" was presented through panel discussions.

The workshop was opened by the president, Mrs. Meyer. Mrs. Norman H. Gardner, immediate past president of the state Auxiliary, and 1963-64 National Chairman of Program led the pledge of loyalty, after which the County presidents were introduced.

Dr. William R. Richards, General Manager of the Connecticut State Medical Society, then addressed the group. He spoke briefly on issues concerning the Medical Society in which the Auxiliary is interested and answered questions on such issues as COMPAC, and "Operation Hometown" which the Auxiliary presented to him.

Our SAC program for 1963-64 was presented by three panels: A. Operate Efficiently, moderated by Mrs. J. Alfred Wilson; B. Program, moderated by Mrs. Norman H. Gardner; and C. Community Service, moderated by Mrs. S. Howard Johnston.

Following discussion of each panel group the meeting was adjourned.

Auxiliary Schedule

September 9, 1963—Workshop

September 23, 1963 — Board Meeting (Carriage Drive, Hamden)

November 12, 1963 — Semi-Annual Meeting — Racebrook Country Club, New Haven—National Auxiliary President, Mrs. C. Rodney Stoltz, guest.

December 12, 1963—Board Meeting

January 27, 1964—Board Meeting

March 23 or 30, 1964—Board Meeting

Annual Meeting — Hartford (date to be announced)

County Chairmen In Connecticut—1963-1964

Fairfield—Mrs. Edward F. Malloy, 90 Hubbard Avenue, Stamford.

Hartford—Mrs. Stevens J. Martin, 35 Woodside Circle, Hartford

Middlesex—Mrs. Vincent Vinci, Randolph Road, Middletown

New Haven—Mrs. Jack Albom, 1781 Boulevard, New Haven

New London—Mrs. Peter Schwarz, 172 Washington Street, Norwich

Windham—Mrs. Sawyer Medbury, Windham

Litchfield—Mrs. Winfield E. Wight, 24 Goodwin Court, Thomaston. (Also State Chairman)

Auxiliary members in Connecticut contributed an average of $4.14 per member in 1962-63. The National goal is $5.00 per member. Let's reach the goal!

1963 Conference

Connecticut will be represented by Mrs. Fritz Meyer, state president and Mrs. Charles F. Krinsky, president-elect at the 1963 Conference of state presidents, presidents-elect and National Officers and Chairmen, at the Drake Hotel in Chicago, October 6-9, 1963.

Mrs. Morton Arnold of Windham Center, Director, Woman's Auxiliary of the American Medical Association, and Mrs. Norman H. Gardner of East Hampton, National Program Chairman, will represent Connecticut on the National level at this meeting.

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Special Notices

ADVANCED PROGRAM
For The Twentieth Annual
NEW ENGLAND POSTGRADUATE ASSEMBLY

Statler Hilton Hotel, Boston, Massachusetts

November 13, 14 and 15, 1963

Wednesday, November 13, 1963

8:00-8:45 Movie.
Medical and Surgical Aspects of Subphrenic Abscess, David P. Boyd, M.D., Lahey Clinic.
Esophageal Hiatal Hernia, J. Murray Beardsley, M.D., Rhode Island Hospital.

9:00 Panel: Recent Advances in Diabetes Mellitus
Moderator: Alexander Marble, M.D., Joslin Clinic, Boston.

Common Obstetrical Problems, Demonstration with Manikin, Robert H. Barker, M.D., Harvard Medical School.

10:40 Lecture: Sensible Management of Fluids and Electrolytes in Surgical Patients, Mark A. Hayes, M.D., Yale University School of Medicine.

Panel: Dangers of Drugs in Pregnancy and in the Newborn.

Moderator: Jerold Lucey, M.D., University of Vermont Medical School.

11:20 Lecture: Diuretics in Treatment of Edema, Norman Levinsky, M.D., Boston University School of Medicine.

12:30 Luncheon

Practical Office Psychotherapy, William E. Schumacher, M.D., Director, Bureau of Mental Health, State of Maine.

2:00 Symposium: Therapy of Breast Cancer: Patient Selection and Treatment Results.
Moderator: Francis D. Moore, M.D., Peter Bent Brigham Hospital.

2:45 General Discussion, Thomas Anglem, M.D., Boston University School of Medicine.

3:00 Mammography, Joseph Marks, M.D., New England Deaconess Hospital.

3:15 Treatment of Late Disease (Use of Corticosteroids, Androgens, Estrogens and Oophorectomy) Kendall Emerson, M.D., Peter Bent Brigham Hospital.

3:45 Adrenalectomy and Hypophysectomy, Richard Wilson, M.D., Peter Bent Brigham Hospital.

4:00 Chemotherapy, Thomas C. Hall, M.D., Chief of Divison of Therapeutics, Jimmy Fund.

4:15 Radiation Therapy, Early and Late, Martin Levine, M.D., Lemuel Shattuck Hospital.

4:30 General Discussion and Questions.

8:00 Ballroom Assembly.
Seminar: "The New England Physicians Retirement Program."

Presiding: M. David Deren, M.D., Chairman, Medical Economics and Insurance Committee, Council of the New England State Medical Society.

Speakers: Frederick W. White, Trust Officer, The National Shawmut Bank of Boston; Robert H. Curran, Group Pension Sales Manager, New England Mutual Life Insurance Company.

Thursday, November 14, 1963

8:00 Movie.
Neurological Signs—Normal and Abnormal (Cranial Nerves), Bernard Alpers, M.D. Discussor: Simeon Locke, M.D., New England Deaconess Hospital.

Innovations in Transfusion Therapy. Discussor: Carl W. Walter, M.D., Peter Bent Brigham Hospital.

9:00 Symposium: Cerebrovascular Disease: Medical and Surgical Aspects.

Moderator: Joseph M. Foley, M.D., Western Reserve School of Medicine.

Physical Fitness and Athletic Injuries, New England Style. Moderator: Daniel F. Hanley, M.D., Bowdoin College.

10:40 Symposium: Big and Little Strokes: To Anticoagulate or Not, E. Charles Kunkle, M.D., F.A.C.P., Portland, Maine.

Newest Treatment of Common Skin Diseases.
Moderator: John L. Fromer, M.D., Department of Allergy and Dermatology, Lahey Clinic.

12:30 Luncheon

Diagnosis of Renovascular Hypertension by Radioisotope Studies. Belton Burrows, M.D., Boston Veterans Administration Hospital.

2:30 Panel: Genetics Applied to Everyday Medicine.
Moderator: Herbert A. Lubs, Jr., M.D., Yale University School of Medicine.

Lectures: Management of Hepatic Coma, William A. Tisdale, M.D., Dartmouth Medical School.

2:45 Acute Eye Problems, Paul A. Chandler, M.D., Harvard Medical School.

3:00 Nasal Injuries: Poor Late Results Can Be Avoided, G. David King, M.D., Lahey Clinic.

3:15 Dizziness May Mean Many Things, John F. Sullivan, M.D., New England Center Hospital.

4:00 Clinico-Pathologic Conference, Presented by Massachusetts General Hospital. Chairman: Robert E. Scully, M.D., Harvard Medical School.

Friday, November 15, 1963

8:00 Movie.
The Ear and Hearing, Dr. George Shambaugh. Discussor: Frank D. Lathrop, M.D., Lahey Clinic.
Acute Head Injury, Dr. Joseph P. Evans and Harold R. Keegan, M.D., Discussor: Edwin F. Lang, M.D., Lahey Clinic.

9:00 Panel: Use and Abuse of Adrenal Steroids.
Moderator: George Thorn, M.D., Peter Bent Brigham Hospital.
Hospital Clinic: What Every Doctor Should Know About Cardiac and Respiratory Resuscitation.
Moderator: James Bougas, M.D., Tufts Medical School.

10:40 Panel: Management of Obscure Fevers.
Moderator: Paul B. Beeson, M.D., Yale University School of Medicine.
Chronic Cough and Shortness of Breath.
Moderator: Theodore L. Badger, M.D., Boston City Hospital.

12:30 Luncheon

Recent Progress in Diagnosis and Treatment of Syphilis, Nicholas Fiumara, M.D., Dir. Div. of Communicable and Venereal Diseases, Massachusetts.

2:15 Panel: Gynecologic Endocrinology.
Moderator: Joseph Rogers, M.D., New England Center Hospital.
Lectures: Emergency Treatment of Burns—John D. Constable, M.D., Massachusetts General Hospital.
Hearing Problems in General Practice, Frank D. Lathrop, M.D., Lahey Clinic.
Treatment of Chronic Pain, Leroy D. Vandam, M.D., Peter Bent Brigham Hospital.
Management of Intractable Angina, Edwin O. Wheeler, M.D., Harvard Medical School.

4:00 Lecture: U. S. Air Force Medical Service Mission in Aerospace Medicine, Major General Richard L. Bohannon, USAF (MC), Deputy Surgeon General, U. S. Air Force Medical Service, Washington, D. C.

ST. FRANCIS HOSPITAL PEDIATRIC SYMPOSIUM

November 13 and 14, 1963

The St. Francis Hospital Pediatric Symposium will be held in the Amphitheater of the hospital on Wednesday, November 13th and Thursday, November 14th. It is sponsored by the Department of Pediatrics and supported by the St. Francis Hospital Association. The program is as follows:

Wednesday, November 13

10:00 A.M. Howard H. Steel, M.D. of Temple University.
"Early Recognition of Defects in Children."
2:00 P.M. Charles V. Pryles, M.D. of Boston University.
"Genito—Urinary Pathology."

Thursday, November 14

10:00 A.M. Thomas Santulli, M.D. of Columbia University.
"Surgical Emergencies in the Newborn Period."
2:00 P.M. Janet W. McArthur, M.D. of Massachusetts General Hospital.
"Pediatric and Adolescent Gynecology."

INTERNATIONAL COLLEGE OF SURGEONS

November 7, 8, and 9, 1963

The Mid-Atlantic Section of the International College of Surgeons will hold its next meeting at the Homestead Hotel, Hot Springs, Virginia on November 7, 8 and 9, 1963. The medical and surgical profession are cordially invited to attend.

BASIC SCIENCE COURSE AT LAWRENCE AND MEMORIAL HOSPITALS

New London, Connecticut

September 10, 1963 — June 9, 1964

September 10 Emphysema. Including Co2 Narcosis, Dr. Wells.
September 24 Rheumatoid Disorders Including Collagen, Dr. Hall.
October 8 Infectious Disease: Fever, Dr. Weinstein.
October 22 Infectious Disease: Gram Negative Bacterial Infection, Dr. Weinstein.
November 5 Infectious Disease: Staphylococcal Infections, Dr. Weinstein.
November 19 Gastric Secretion and Peptic Ulcer, Dr. Culver.
December 10 Bilirubin, Dr. Isselbacher.
December 17 Malabsorption Syndromes Including Exudative Enteropathy, Dr. Isselbacher.
January 7 Hepatitis, Dr. Isselbacher.
January 21 Cirrhosis, Fatty Liver; Coma, Dr. Garceau.
February 4 Pituitary and Gonads, Dr. Dingman.
February 18 Thyroid, Dr. Ingbar.
March 3 Diabetes Mellitus, Dr. Steinke.
March 17 Adrenals, Dr. Cahill.
March 31 Fundamentals of the EKG, Dr. Polansky.
April 14 Cardiac Therapy: Digitalis, K, Dr. Gorlin.
April 28 Current Status of Open Heart Surgery, Dr. Harken.
May 12 Abnormalities of Acid-Base Metabolism, Dr. Schwartz.
May 26 Glomerulonephritis: Uremia, Dr. Guild.
June 9 Transplantation, Dr. Merrill.

Registration is limited to 75, and the tuition for the 20 lecture course will be $100,00. The course must be subscribed in its entirety. Completion of the application and check for $100.00 made payable to the Lawrence and Memorial Hospitals, New London, Connecticut, will register the applicant.

HEZEKIAH BEARDSLEY PEDIATRIC CLUB

Wednesday, October 23, 1963

The Hezekiah Beardsley Pediatric Club will convene Wednesday, October 23, 1963 for a half day meeting at the Yale Medical Center.

Grand Rounds 12:00 to 1:00 P.M., Luncheon at 1:00 P.M. The afternoon program will be centered around the subject "Care and Study of Children with Congenital Abnormalities." Dinner at 7:00 P.M.

180th SEMI-ANNUAL COUNTY ASSOCIATON MEETINGS

September 25—Hartford County
October 2—Fairfield County
October 3—New London County
October 8—Litchfield County
October 10—Middlesex County
October 15—Tolland County
October 17—Windham County
October 24—New Haven County

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NEW BOOKS IN REVIEW

ANOTHER SYMPOSIUM ON BONE MARROW THERAPY: THIS TIME IN MONKEYS. Proceedings of the International Symposium on Bone Marrow Therapy and Chemical Protection in Irradiated Primates. A symposium of 33 participants, 20 papers, and 59 authors, held at the Biological Institute of the Organization for Health Research, T.N.O. on August 15-18, 1962, Rijswijk (Z.H.), The Netherlands; published on November 1, 1962, by Kripps, Rijswijk (Z.H.), The Netherlands. 455 pp.

Reviewed by: MARSHALL BRUCER

This book has the table of contents on the last three pages. There is nothing wrong with this; it is just a little bit unusual. The paper covers, however, are on the outside and the usual black ink and white paper is used. In August, 1962, 33 experts in their field got together to discuss: (1) bone marrow transplantation in monkeys, (2) the immunological activity of the human or monkey fetus, (3) the management of monkey colonies, (4) human applications of bone marrow transplantation, and (5) the chemical protection of primates.

The symposium disclosed again that at least a dozen chemical substances, administered properly before radiation, would allow mice to live not 8 days, but 17 days. This is awfully important to mouse doctors. For human doctors, some questions were raised. *"There is even some question as to the feasibility of large-scale screening programs in mice when the object is to discover protective agents that can be used in man."* Bone marrow transplantation therapy for radiation is just as disappointing as chemical protection. It is successful in mice up to the radiation dose that causes intestinal damage. There was a great problem in selection of the proper donor material. Of course, the mouse might die from a secondary disease, but even this can be treated, or prevented (in the mouse).

The whole point of the symposium seemed to be a rather belated recognition that mice are not men. On page 437, it is recognized that *". . . results obtained in rodents . . . cannot a priori be extrapolated to primates."* The symposium contains a fascinating discussion of how to raise chimps and how to clean monkey cages. *"Yes, I think the cost of maintaining a breeding colony of rhesus monkeys is staggering. . ."*

This well-written proceedings of a well-organized symposium reiterates the tremendous disappointment in chemical protection in bone marrow therapy for irradiation disasters. However, the symposium was not organized to produce a cookbook for human therapy. A small group of experts have recognized their utter failure in a field that looked like it was going to be a success. They are trying to find a new approach.

If you plunge an Auriphlubic apple with an 0.269j skin into 0.27 Mp *Tauropulic* acid, the resulting orange juice cannot be said to *Piorogenes extriciteriun n.* because pineapple juice is subtoxic. Some people might think this statemen is totally meaningless (and it might be). Some physicians might think that scientists are scatter brained among trivialities (and some might be). Only with 20/20 hindsight at the end of time will it be possible to say that any research is worthless. Certainly the recognition of failure and the

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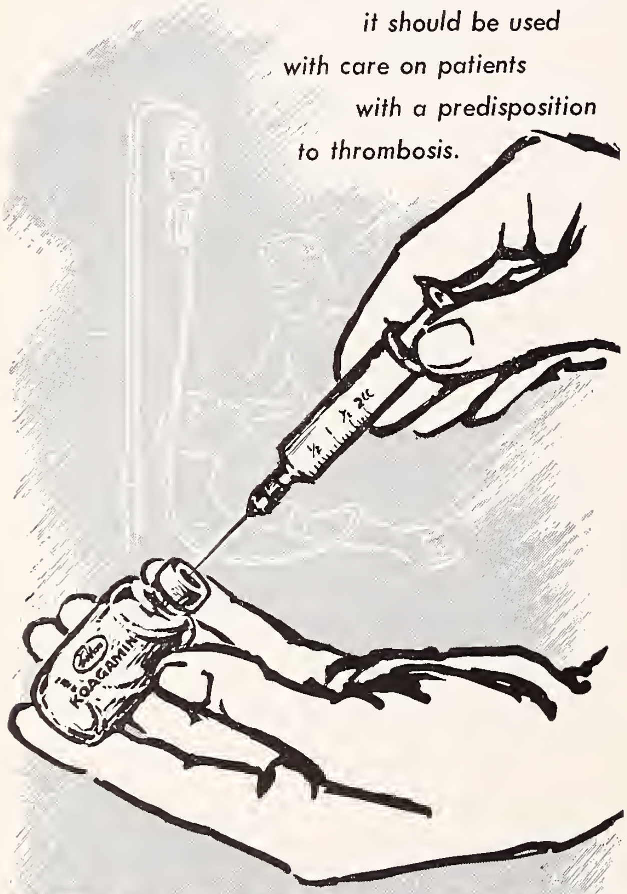

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attempt to find a new direction is a breath of fresh air in the grantsmanship of radiobiology. This appears to have been an exceptionally productive symposium—for expert biologists, not for practicing physicians. It is well-written, adequately printed, easily read. The symposium may not have shaken any foundations, but it marks a change of direction with professional skill.

TUBERCULOSIS IN CHILDREN by Edith M. Lincoln, M.D., and Edward M. Sewell, M.D., McGraw-Hill Book Co., Inc., New York, New York, 1963, 327 pp. $12.95.

Reviewed by: HARRISON F. WOOD

This book will be a classic in the pediatric literature and will almost inevitably be referred to for many years to come whenever any of the myriad problems of tuberculosis in childhood are encountered. It presents in comprehensive but lucid form forty years experience with 3,500 tuberculous infections encountered on the Children's Medical Service of Bellevue Hospital and surveys the follow-up of 1,000 children with fresh tuberculous infections and 2,500 with various tuberculous diseases. The period covered by this survey, 1922-1962, saw a changing epidemiology of the disease, refinement in methods of diagnosis, and the dramatic change in the outlook for the tuberculous child which was introduced by chemotherapy. These, the most rapidly changing aspects of tuberculosis, are thoroughly covered, and in combination with other aspects of prevention, will probably warrant future revised editions of the book. The chapters on primary tuberculosis and tuberculosis of specific organ systems with the related material on pathogenesis and mechanisms of systemic dissemination of the disease will probably remain essentially as they stand. It is most unlikely that any pediatrician in the United States will ever again have the opportunity that Dr. Lincoln had to observe the complete natural history of this disease and to treat such a multitude of tuberculous children. This book represents the culmination of a momunental achievement in American pediatrics.

COUNSELING IN MEDICAL GENETICS. Second Edition by Sheldon C. Reed, Ph.D., W. B. Saunders Co., Philadelphia, Pennsylvania, 1963, 278 pp. $5.50.

Reviewed by: HERBERT A. LUBS, JR.

Few American medical texts are very readable. This one is. *Counseling in Medical Genetics* is a light-hearted, enjoyable account of the experiences accumulated in 2500 cases referred for counseling at the Dight Institute at the University of Minnesota. The extent of discussion reflects primarily the frequency with which cases presented since 1941. Disorders with a frequency less than 1/1000 are treated only by inclusion in a list of several hundred genetic diseases. Reed's recognition of the need to deal honestly with parents' feelings of guilt and other emotional reactions to an abnormal child is presented with particular effectiveness through his nicely detailed, but brief illustrative cases. The odds for future children were presented both accurately and with the sensitivities of each family in mind. The often used statement that lightning never strikes twice in the same spot is hardly good medicine, as is pointed out.

In order to counsel effectively one obviously must understand genetics. This edition has been brought up to date and the application of simple Mendelian genetics to medicine is well presented as are the chromosome disorders. The central idea of the chapter on "The Ubiquitous Heterozygote" is a particularly important one for the practicing physician to have built firmly into his medical thinking. There is, however, an inherent weakness in the book. The text is built around the more common genetic diseases, but it is just this group in which it is most difficult to be certain of the precise mode of inheritance. Many of these presentations might better have been written with less certain conclusions. Good documentation of the source of his point of view is always provided, but rarely so for other points of view. Similarly in the commendable effort toward a simple, brief book, the list of genetic diseases and references is somewhat misleading. Many disorders are inherited in several ways with major clinical differences in each type, and reference to only one of these is usually given. The reference of polycystic kidneys, for example, is to the less common recessively inherited form rather than the dominant type. It is also distressing to see the number of apparent telephone and letter consultations included in the case reports.

In spite of these limitations the book can be warmly recommended to every physician who would like to make better use of genetics in his practice. At the same time, however, the more complicated or uncertain cases should be referred for counseling and accurate diagnosis.

INHALATION ANESTHETICS AND CARBOHYDRATE METABOLISM by Nicholas M. Greene, M.D., M.A., B.S., Professor of Anesthesiology and Lecturer in Pharmacology, Yale University School of Medicine; Director of Anesthesiology, Grace-New Haven Community Hospital. The Williams & Wilkins Company, Baltimore, Maryland, 1963, 143 pp. $7.00.

Reviewed by: JOHN D. MURPHY

This small volume reflects the modern trend in medicine of specialization. It is a detailed consideration of a subject of limited scope. Dr. Greene has covered the subject of carbohydrate metabolism and inhalation anesthetics thoroughly. His excellent monograph gives us a fine refresher course in biochemistry as well as the latest thinking concerning important metabolic effects of the inhalation agents. His critical review of the literature leaves little doubt as to the importance of the subject and the need for considerably more well-planned and executed laboratory and clinical studies. Several of the more important papers dealing with carbohydrate metabolism and anesthetics receive from Dr. Greene a meticulous "dissection," convincing one that *valid* concepts and conclusions springing from presently available work in the field are all too few. Further, controlled studies with clarity of purpose are wanting.

The book is divided into six sections and covers all the useful inhalation agents with the possible exception of chloroform. The first section reviews the biochemical principles and pathways of glucose metabolism, pyruvic and lactic acid formation, and the Embden-Meyerhof and Krebs metabolic cycles. A clear, concise and patient presentation by the author enables the reader to grasp more easily a complicated subject. Numerous chemical equations, formulas and schematic diagrams aid in understanding the newer concepts of these metabolic pathways, perhaps last encountered by most of us in medical school. The importance of high-energy phosphate bonding in cellular metabolism is stressed.

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- *62% were survived by their wives and families.*

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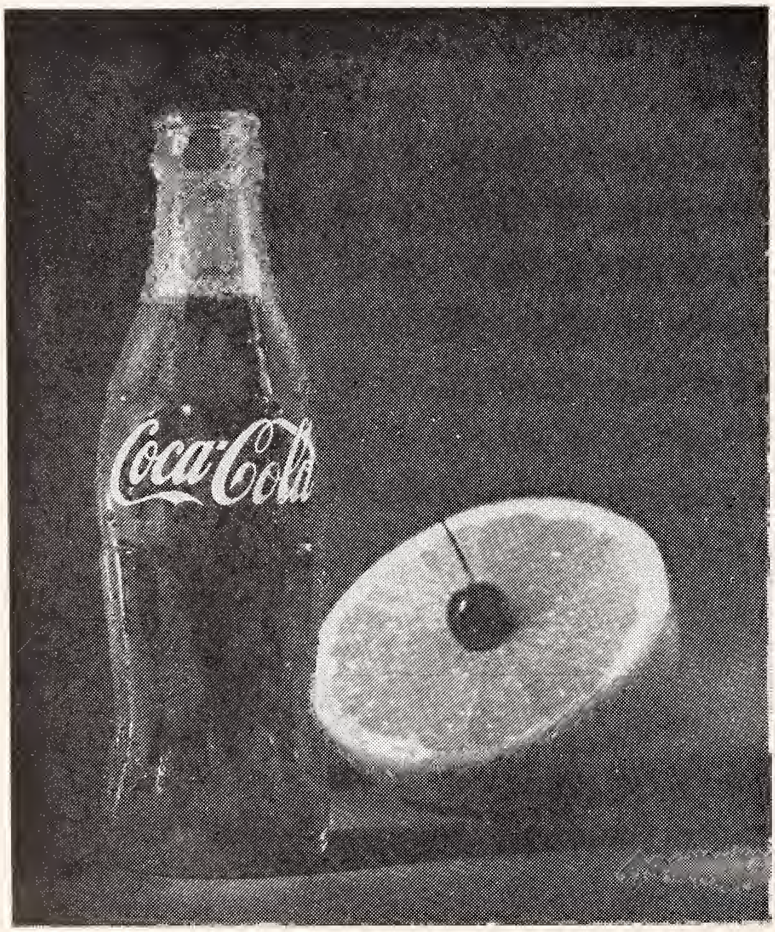

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The bulk of this monograph is devoted to an exhaustive review of the effects of diethyl ether on carbohydrate metabolism. As the author points out, this agent has been studied in great detail, both in vitro and in vivo, almost to the exclusion of other inhalation anesthetics. The role of liver and muscle glycogenolysis are discussed as well as the possible influences of epinephrine, insulin and adrenal corticosteroids on lactate and pyruvate levels. The newer concept of "excess lactate" and its relation to altered tissue perfusion during anesthesia is alluded to frequently.

The third section is concerned with a brief discussion of the available literature and thinking on the effects of cyclopropane on metabolic carbohydrate pathways. The remaining three sections highlight the all too meager reports on the other inhalation anesthetics (nitrous oxide, ethylene, halothane, divinyl ether, Trilene, methoxyflurane and Fluoromar).

An extensive bibliography, including several reports from the foreign literature adds much to the value of this treatise. The book is well bound and the typesetting is adequate for easy reading. The author has done well in gathering heretofore scattered information together in a succinct and timely volume. While the material may not be readily applicable clinically, it is an invaluable addition to the reference library of every anesthesiologist.

BASIC ANXIETY. A New Psychobiological Concept by Walter J. Garre, M.D., Philosophical Library, Inc., New York, New York, 1962, 123 pp. $5.00.

Reviewed by: LOUIS H. NAHUM

This little book which ranges over many areas of psychiatry, from anxiety to alcoholism, juvenile delinquency, and hypnosis, contains ideas which the author states were arrived at through "introspection." He believes "the observer can only see what he is emotionally free to see." Therefore, everything must perforce be biased and there remains one last avenue to arrive at truth "serious and honest introspection." Thus one will not find in this book clinical illustrations, tightly reasoned analysis or even references to any predecessors.

Actually the problem of anxiety, because of its universality at least to human beings has invited attention of profound students of human behavior. Freud's *The Problem Of Anxiety 1926* pointed out "In both respects alike as an automatic phenomenon and as a safety signal, anxiety proves to be a product of the psychic helplessness of the infant which is the obvious counterpart of its biological helplessness." Sullivan introduced the "significant person" concept in the infants life and believed anxiety results from disapproval by the "significant one" and becomes a tool in the learning process. More recently, Grinker in a brilliant essay attempted a unitary concept of personality and behavior utilizing anxiety as a central mechanism. But it attempted to reveal the basic nature of anxiety building upon the solid base of the distinguished predecessors.

In the present volume a single aspect of the possible genesis and maintenance of anxiety, namely the degree to which an infant is made to feel rejection by the mother is referred to as the "basic." The idea is not new and it was not necessary to "introspect" to arrive at it. In a recent important work of Rene Spitz it was shown that the infant who did not receive love and attention would appear dejected, withdrawn, unresponsive, irritable—an anaclitic depression." Furthermore, "introspection" was not necessary to describe the defenses against anxiety since it has all been quite thoroughly described in the important works of Sigmund and Anna Freud and many other great thinkers in the field.

The thoughtful clinician will be quite disconcerted by the authors speculations that the emotional life plays a real role in the development of such diseases as poliomyelitis and cancer! Physicians accept the fact that psychological and physiological homeostasis is important in mental and physical health of individuals. But he will recoil from the leap over the chasm of logic to a specific cause and effect which is certainly fanciful.

From the point of view of child care there has actually been a significant trend away from blaming the mother for all emotional disturbances in their children, a trend led by the redoubtable Dr. Ben Spock. The present volume by pointing what seems to be an incomplete and distorted view of the most meaningful relationship, can only heighten anxiety in the mother.

The author appears to understand what animals do and do not feel. Page 7 "Animal cub in its 'natural habitat' cannot conceivably feel the anxiety!" The infant speculates "are my mother and father prepared if need be, to risk their very lives in the protection of mine?" The story book narrative continues with "the human infant on the other hand will be pervaded on the emotional level that his mother may be unwilling to risk her life in his protection!"

I believe, enough has been said to indicate that this book does not contribute anything noteworthy to the basic understanding of anxiety. His understanding of the nature of anxiety is limited, served up in pedestrian writing, with no logic, little original insight and no enrichment from a great constellation of investigators and thinkers beginning with Freud.

INTERNAL MEDICINE IN WORLD WAR II—Volume II—Infectious Diseases by Col. John B. Coates, Jr., M.C. — U.S.A., Editor-in-Chief. Editor — W. Paul Havens, Jr., M.D. Published by Medical Department, U. S. Army.

Reviewed by: DENIS S. O'CONNOR

The difficulty of knowing beforehand just where the theatres of operation will be in a war makes advanced planning for the handling of some diseases impossible. Certain diseases which are common to all geographical areas and countries can be expected but even here their incidence and their effect on military operations cannot always be foreseen.

The acute and chronic upper respiratory diseases, tuberculosis, the streptococcal and venereal diseases have been, and probably always will be, problems of military medicine, although the emphasis will vary with the advances in control of these diseases. Anyone who has an interest in any of the above diseases will doubtless find interesting aspects of them in the experience of the medical department in that war, as reported in this volume.

It is rather the exotic diseases, acquaintance with which most doctors have had only through textbooks and other medical literature, that claims our major interest in this volume.

Malaria, though sporadically seen in the United States, is not a disease with which many doctors have had wide clinical experience, and yet the fact that it was historically known to be controllable by quinine gave doctors a smug feeling as to their ability to handle its' occurrence. Unfortunately, the source of quinine was in the hands of one of our enemies and atabrin, though it was eventually found to be a highly effective therapeutic agent as well as a suppressor when properly used, suffered from our inexperience of proper usage, prejudice against it by some doctors and inadequate disciplinary control over its' usage. It is the story of these aspects of malaria and the personnel ineffectiveness from the disease in the earlier part of the war that makes such interesting reading. Asia, Africa and the South Pacific all had the problem and the story of the medical department of the Army's experience as presented in this volume, is the best substitute for actual clinical contact with this disease or group of diseases.

Typhus, which in the not too distant past, was a disease—an outbreak of which in the fighting forces was a cause for alarm—was experienced in various forms in World War II. An effective vaccine, although it did not always prevent, at least did ameliorate the form of the disease. Laboratory tests made exact diagnosis possible and para-amino benzoic acid proved to be an effective remedy. As in malaria, textbook descriptions of this group of diseases was a poor substitute for clinical experience. Much of the information coming out of the war was the work of the United States Typhus Commission in Egypt. Again, we have a fascinating story of the control of a hitherto frightening group of diseases.

Another interesting and surprising experience of the war was the role of the diphtheria bacillus in chronic skin lesions. Until the role of this organism in chronic ulcerative lesions of the skin was recognized, such lesions were a source of much personnel ineffectiveness. This form of diphtheria was apparently endemic among the civilian population and created an immunity to the faucial type. In susceptible individuals faucial diphtheria was frequently contacted from individuals suffering from cutaneous diphtheritic lesions.

Sand Fever, Dengue Fever, Rheumatic Fever and Meningococcal infections are covered but they did not create the problems posed by Malaria, Typhus and Diphtheria.

The value of this volume as a source of historical material on the three principal groups of diseases mentioned above is invaluable. For the doctor who cannot obtain wide clinical experience with these diseases, the material in this volume is an acceptable substitute and with the rapidity of travel today who knows when he may have to face the diagnosis and treatment of these diseases.

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features

the following new books and new editions in their full page advertisement appearing elsewhere in this issue:

CURRENT PEDIATRIC THERAPY — Edited by Gellis and Kagan. This new book gives you the best treatments, currently in use by leading authorities, for over 300 diseases and disorders that afflict Children.

MAINLAND — ELEMENTARY MEDICAL STATISTICS—A New (2nd) Edition—revised to bolster your statistical thinking and also your use of the standard statistical formulas and procedures.

BOOKS RECEIVED

Books received for review are acknowledged in this department and such acknowledgement must be regarded as a sufficient return for the courtesy of the sender. Selection will be made for review in the interests of our readers and as space permits.

Crossen's Synopsis of Gynecology, Sixth Edition by Daniel Winston Beacham, M.D., and Woodard Davis Beacham, M.D., The C. V. Mosby Co., St. Louis, Missouri 1963 371 pp. $7.50.

Physical Diagnosis The History and Examination of the Patient by John A. Prior, M.D., and Jack S. Silberstein, M.D., The C. V. Mosby Co., St. Louis, Missouri 1963 455 pp. $8.50.

Year Book of Cardiovascular and Renal Diseases 1962-1963 series. Edited by W. Proctor Harvey, M.D., John W. Kirklin, M.D., Alexander S. Nadas, M.D., Oglesby Paul, M.D., Victor E. Pollak, M.D., T. Joseph Reeves, M.D., Robert W. Wilkins, M.D., and Irving S. Wright, M.D., Year Book Medical Publishers, Inc., Chicago, Illinois 1963 543 pp. $10.00.

Thrombophlebitis by Roger M. Morrell, M.D., Grune & Stratton, New York and London, 1963 182 pp. $6.50.

PLACEMENT WANTED

The Society's Placement Service is in receipt of the following:

Howard P. Friedman, M.D., age 31—M.D. State University of New York Downstate Medical Center 1957. Specialty General Surgery. Available June 1964.

Kenneth J. Sainsbury, M.D., age 32—M.D. Cornell University Medical College 1957. Specialty Internal Medicine.

Internist, Board Certified. Age 32, family Catholic. Interested in an association with internist (s) group.

Board-certified pediatrician, interested in associate or group practice or an opportunity for solo practice. Age 45—M.D., Royal College of Medicine, Baghdad, Iraq., 1947—M.P.H. degree—Harvard, 1954. Postgraduate work in pediatrics, London, England, 1954-55; Children's Hospital Medical Center, Boston, Massachusetts. 1955-1963.

ANYONE INTERESTED IN THE ABOVE IS ASKED TO COMMUNICATE WITH THE GENERAL MANAGER'S OFFICE, 160 ST. RONAN STREET, NEW HAVEN.

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Connecticut Medicine

editorials

Tale Of The Hippocratic Timber

Hippocrates was born on the Greek Island of Cos about 460 B.C. Visitors of the Dodecanese Islands of Greece in the Aegean invariably include the Island of Cos as a stopover, and the physicians who have been fortunate enough to visit this island look for an old plane tree under which Hippocrates taught his students. This tree has since become famous and now enjoys the protection of the Greek Government. Readers of Wilder Penfield's "Torch" have been fascinated by a fictional account of Hippocrates' life and times, and his teachings under the plane tree. The tree is now of great size and antiquity, with a giant trunk and broad branches, so heavy as to require artificial support and one can photograph the entire tree only from a considerable distance (see front cover). It is believed that many physicians as they stand in reverence and reverie under this particular plane tree are wont to renew their Hippocratic Oath.

The relation between this old tree and the American College of Physicians may seem quite remote to many of us, even though Hippocrates as founder of the principles and practice of medicine must remain the patron saint of an institution like the American College of Physicians which is dedicated exactly to Hippocrates philosophy. Recently, this relation has assumed new meaning, so that a very close and direct connection has been established due to a "brain storm" on the part of Dr. Irving Wright and Dr. Abernethy who tells the story in the *Bulletin of the American College of Physicians.*[1]

The central theme apparently was a search for a suitable mace for the college. The story begins in a Philadelphia setting—the November meeting of the Board of Regent's at which the subject of a mace for the college came up for discussion, and Dr. Irving S. Wright was appointed chairman of an ad hoc committee to explore the matter and bring in specific recommendations to the regents. Dr. Wright conceived the idea of trying to obtain a piece of timber from the famous plane tree on the Island of Cos. After the meeting, Dr. Abernethy somewhat in jest told to Dr. Wright that he might be able to obtain such a piece of wood. Far from Dr. Abernethy's mind was what was involved in the niceties of diplomatic protocol that such a quest would involve. Before it was realized over eight different agencies of the United States and Greek Governments were recruited.

The good offices of his excellency, Harry R. Labouiss, U. S. Ambassador to Greece were enlisted in the aid of the college endeavor. He, in turn, sought the aid of the parliamentary deputy from the Dodecanese Islands, who promised "to try to get a branch from old plane tree near the site where Hippocrates practiced." The wheels of diplomacy were apparently set in motion for soon Mr. Henry M. Baer, Agricultural Attache, informed Dr. Abernethy that the coveted piece of timber from the island of Cos has been obtained through the efforts of the Honorable John Zigdis, Parliamentary Deputy for Cos, and that it was being shipped by A.P.O. Parcel Post and would arrive in six weeks. But the "course of love" is not always so smooth, for then a letter arrived from the agricultural secretary that the previous parcel could not be shipped without a phytosanitary certificate!

Finally, this was obtained and so was a certificate from the Mayor of Cos attesting to the authenticity of the log. When the log finally arrived, it was 1.3 m. in length and 0.13 m. in diameter. The piece of wood from the original tree supposedly over 2,000 years old was forwarded by the Department of Agriculture after inspection. Wrapping removed, it didn't appear as weather beaten as anticipated! A brownish green bark had come off in irregular patches producing a colorful mosaic. It was straight five inches at its greatest diameter and four inches at its smallest end, 5′ 8″ tall and weighing 45 pounds. The log was too heavy to carry to Denver for the next meeting of the Board of Regents, but they gracefully accepted it through viewing the photographs and instructed the committee to send in a final report.

How to preserve this treasure for many years to come posed many perplexing problems but the Smithsonian Institution in Washington, and the U. S. Department of Agriculture in Madison, Wisconsin have made many useful suggestions. Pending the final report, the log was resting peacefully in a tub of water in Dr. Abernethy's basement!

Dr. Abernethy was not the first nor will he be the last to be pursued by the press. One day shortly after receipt of the news that the log was on its way, he received a phone call during his office hours from a writer of the U. S. Information Agency who learned of the expected arrival of the log, from a representative of that office in Athens! Then for weeks, officials from the Voice of America kept contacting him for a story to be beamed to Greece, this before the log was officially accepted and while it was still soaking in a bath tub! It is no accident that he is a Governor of the College for his skill in avoiding entanglement by the press can be a model of behavior for all of us.

For the present there is much symbolism involved in this interesting tale. Clearly the small piece of wood is a late offspring of an ancient tree even as the "College" is a natural sequel to Hippocrates. The log is heavy and future presidents will be expected to be either young or spared from coronary disease by medical progress. Old maces are made of metal. This one is a departure, symbolizing the breaking of tradition and at the same time establishing historical continuity between the past and the future. We congratulate the college and when we attend one of its meetings, we will sit in reverence and renew our "Oath of Hippocrates."

L.H.N.

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Cycles And Timing In Biology

> *There is a procedure in every part of nature that is perfectly regular and geometrical if we can but find it out.*—John Woodward (1699)

It is now widely known that the flight V of the Canadian goose, high in the autumn sky, as it migrates southward, is the symbol of the season, since it is initiated by a change in the length of the nights. This is a display of photoperiodic response in animals, just as the flowering of the colorful poinsettia in the Christmas season is a similar example in plants for the poinsettia blooms in response to long nights. Thousands of other examples of photoperiodism could be given. By this means, animals and plants adapt to variations in their surrounding. Photoperiodism implies a time measuring system, but what is the mechanism that animals and plants use to measure the season and the day. In a fascinating article in *Science,* Hendricks[1] brings some light into the manner in which plants distinguish between light and dark as well as how some mechanism of timing in animals operates.

A red marine flagellate (Gomyanlax polyhedra) is luminous in the surf and emits this light in accordance with a rhythmic circadian pattern. In plant growth, there are strong seasonal dependencies but there are also evident daily rhythms. Reproduction through flowering is controlled by the length of the cycle. Soybeans and Chrysanthemums require long nights of autumn, whereas wheat and snapdragons require the short nights of early summer. Interestingly enough plants of either group can be made to flower by controlling the length of the night. In some plants one night of suitable length is adequate to bring about flowering whereas a small amount of light in the darkness can suppress flowering. This of course, implies the reception of light by a pigment in the plant. Hendricks has shown that the pigment is in two forms. It is blue, absorbs red light and exists in such minute quantities that it is not visible in the leaves of the plant. Eventually the flower promoting effect of the absorption of red light is reversed by radiation at wave lengths near the red limit of vision. The plant also has a daily timing pattern for photosynthesis of eight to fifteen hours following which the photosynthetic reserves are used up. There is a decay of far red-absorbing to red absorbing pigment which takes one hour, then darkness with continued use of reserves at a slowing rate with a very low level of far-red absorbing pigment the remainder of the twenty-four hours. This is an ideal condition for the generation of rhythmic variation of many reaction sequences, but whatever their nature, the far-red absorbing pigment is a controlling factor.

The photoperiodic responses in animals are similar in that they arise from a basic dependence upon a characteristic rhythm. The marine polyp under the stimulus of light releases into the surrounding water eggs and sperm sixty-eighty minutes later. In the Hydra, gametes are released one hour after illumination is begun. The white toed deer mouse if kept in continuous darkness is active for four hours out of the twenty-four and the activity begins every twenty-two hours and fifty minutes. If light is introduced each day then the period of activity pattern becomes exactly twenty-four hours. This same general pattern has been extensively observed in other animals and insects. The cockroach when kept in the darkness has an activity period of twenty-two hours and ten minutes. This period is constant for an individual insect to within two minutes and is about a day, that is, the pattern is circadian. There emerges from all this a scheme of rhythmic action in which a period of time is involved, a period between an initial and final reaction. There are a series of reactions from an initial one in which a product increases for a time to a final one which feeds back to reduce the initial rate.

Control through hormone action is another of the possibilities arising from the action in succession of one endocrine system upon another forming a series of actions that consume time. Much is known about this in man, but insects are better experimental subjects. If you block an insects eyes, you prevent phasing of activity by light. The light

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Reference: 1. A.M.A. Council on Drugs: J.A.M.A. 183:469 (Feb. 9) 1963.

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stimulates neurosecretory cells in the brain which discharge a hormone along the nerve axons to the corpus allatum which in turn secretes a hormone which functions to increase the rate of respiration and the associated activity.[1] The timing then is dependent on two factors, neurosecretory cells of the brain and the activtiy of the corpus allatum. The final display is activity of the cockroach. If the eyes are blocked or the neurosecretory cells damaged, activity ceases.

The metamorphosis of the insect is controlled by another endocrine organ the prothoracic gland, which secretes ecdyosyn. This ecdyosyn acts as a desuppressor of a gene to produce an enzyme and finally a system of enzymes necessary for the transformation of a pupa to an adult.

Rhythmic and time dependent activities surely occur in man but not in such extreme form as in many creatures of the wild. There have been described variations in the number of eosinophiles and mitotic division of epidermal tissue which undergo several fold change from a maximum near midnight to a minimum during the daylight hours. Variations in body temperature are known and so is the timing of puberty and the menstrual cycle. We will need much more knowledge of the endocrine system, of the nature of the hormones and the means by which hormonal function is controlled.

Timing is beautifully illustrated in migration and navigation of birds, bees and butterflies. Both bees and birds use an internal timing system so that they are able by observations in the azimuth position of the sun to establish direction. A bee on a nectar collecting expedition fixes the position of the hive relative to the sun. A captive bird, with its seasonal requirements for migrating met, flutters along in its direction of migration regardless of the time of day, if it can make an observation on the sun or perhaps on a constellation, if it is a night migrator. It appears that neurosecretory cells in the hypothalamus are active in the bird that is preparing for migration and if the cells are damaged or the fibers leading from the cells, then the seasonal displays are suppressed.

Precision in timing is perhaps the most striking feature of seasonal and daily variation in plants and animals. In man many of the dynamic systems which regulate our bodily equilibria describe cyclical rhythms. They often correspond to cosmic events and thereby come around yearly, monthly or daily and the period of other cycles are shorter still. In a study of the excretion of salt and water in healthy men Mock[2] et al observed that the equilibria of intake and output oscillated in fairly broad waves with retention for a few days followed by diuresis. When a potent diuretic was given to an individual at the end of the diuretic limb of his cycle, it had far less effect than when administered after a period of retention. Similarly gastric activity was found to describe a cycle in the unfed human coming on about every three hours and lasting twenty minutes. Wolff found that a cholinergic drug was relatively ineffective in setting up contractions if given shortly after the end of a spontaneously occurring cycle of activity.

It may also be that our tendency to be sick is greater at some time than others. Halberg[3] for example found that the capacity of a mouse to withstand endotoxin produced by Escherichia coli varies with the circadian cycle of light and darkness. A dose that killed 85 per cent of mice at their subjective noon killed less than 5 per cent at their subjective midnight. Perhaps many of our diseases represent simply too little or too much of a normal adaptive mechanism, and regulation of these reactions is often achieved through cyclic variation in our homeostatic systems. Wide swings in a cycle need to be uncovered so that we can take advantage of them in supporting health and avoiding illness.

L.H.N.

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Economic Inroads Of Disease: 1. Cardiovascular Disease

Surprisingly little thought has been given to the cost of sickness or disability in terms of our national economy. Cancer has been alleged to cost 15.44 billions annually; while alcoholism has been estimated to cost industry more than one billion each year. What does it cost in dollars and cents to our economy to deal with the problems of heart disease? In a recent article in *Circulation,* Felton and Cole[1] come to grips with the high cost of heart disease. Such an analysis should draw the interested attention of economists, organized medicine through its physician members, and the consumers. These authors point out that 1.05 billion dollars was lost per year in personal income because of deaths from cardiovascular disease. They estimate further that Federal Income Tax lost on this sum was 137.3 million dollars.

As far as cardiovascular disability costs to industry are concerned, Felton and Cole calculate that there were 51.9 million work loss days sustained by the usually working population because of cardiovascular conditions. They assumed that there are twenty-two average working days per month. Then there are 264 working days per year including vacation days which in most instances are paid and thus equivalent to the usual work days. On the basis of an annual average income of $4,211, and average income per day of $16, one finds a total of 830.4 million in unearned wages each year because of cardiovascular disability. But this is not the whole story for in considering absentee costs "for every dollar our employees fail to take home, it costs industry one or two dollars extra." Using the single value, one finds 1.66 billion as the cost to industry for lowered productivity caused by absenteeism due to cardiovascular disease.

The benefit payments, payments for illness, absenteeism excluding production cost, amounts to considerably over 10 billion per year for the American industry as a whole. Since cardiovascular conditions account for 12 per cent of all time lost, the amount paid by industry in the form of cash benefits for cardiovascular conditions amounts to 1.2 billion. Furthermore, if there is added to the sum the cost of an employee death or turnover, recent studies indicate an average figure of 124.7 million as the cost to industry of replacements for those lost through cardiovascular conditions. Totalling all these sums up, Felton and Cole found an estimated national cost of 4.173 billion, equivalent to 5.8 per cent of the national budget for the year of calculation, and this excludes the cost of medical care. Truly a staggering sum.

There are, of course, other factors which if included, would increase the national cost. These are state income taxes, local taxes, medical care expenses. There are others more difficult to measure, such as lowered buying power with its diminished retail and wholesale business. There may also be mitigating factors which in part could balance out some of the above losses, such as financial gain of pharmaceutical companies, of pharmacists, of physicians, of hospital equipment suppliers, and all other in a position to offer services to cardiovascular patients for remuneration. One might even make out a case that there may be some gain to the economy through employment of persons replacing the disabled and those that have died. We needn't include in these estimates the cost of a premature funeral, because in the end the undertaker gets them anyhow.

There are many factors that are still unknown. There are great differences in lifetime incomes between the college graduate and postgraduate groups, and the inadequately educated segment of the population. How does this affect the worth of using an "average" wage in all calculations. Certainly a doctor, lawyer or business man with a larger income, who becomes disabled from cardiovascular disease represents a greater loss to the national economy than an employee of industry. Then there remains the question of whether all get heart disease at the same age, with the same degree of disability, and with the same prognosis. Then there is the question of how much cardiovascular illness is caused by the stress of low incomes or does the stress of corporate life or professional life balance this. It is obvious that there are many elements that could enter into a discussion of the weighing of the factors.

The specific statistical studies indicated by Felton and Cole studies are clear however. First there should be a determination of the impact of disease on the working population in terms of the actual or estimated number of persons in the work force with the time lost from cardiovascular conditions in whom heart disease is the primary cause of the time lost, and not just one of the several disabling disorders. Then there should be a determination of the national average of sick benefits paid under insurance coverage plans in terms of the number of days for which the benefits were paid and the amount of money involved. Finally there should be available data of the average amount of paid and non-paid vacation time taken by the usually working population in the number of days. With these additional figures, it might be possible to determine the impact of disability on personal income if any.

Felton and Cole have made an effort to demonstrate the impact of disability of a specific group of disease states on the national economy. It is urgent that comparable cost measuration of this country's other leading chronic diseases be undertaken. It is certain that such data can stimulate increased interest in the prevention, control and eradication of disease and rehabilitation of its victims. The stark reality of the magnitude of the social and economic problem of the cardiovascular diseases will certainly motivate research; epidemiologic, preventive control, and rehabilitation activities in this vast area of human wastage.

L.H.N.

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Calciphylaxis

Selye[1] has described the production in animals of a form of calcification that he termed calciphylaxis. He administered large doses of parathyroid extract and other calcium mobilizing agents like dihydrotachysterol to rats and while the rats were in this state, a challenge such as plucking a hair or inject-

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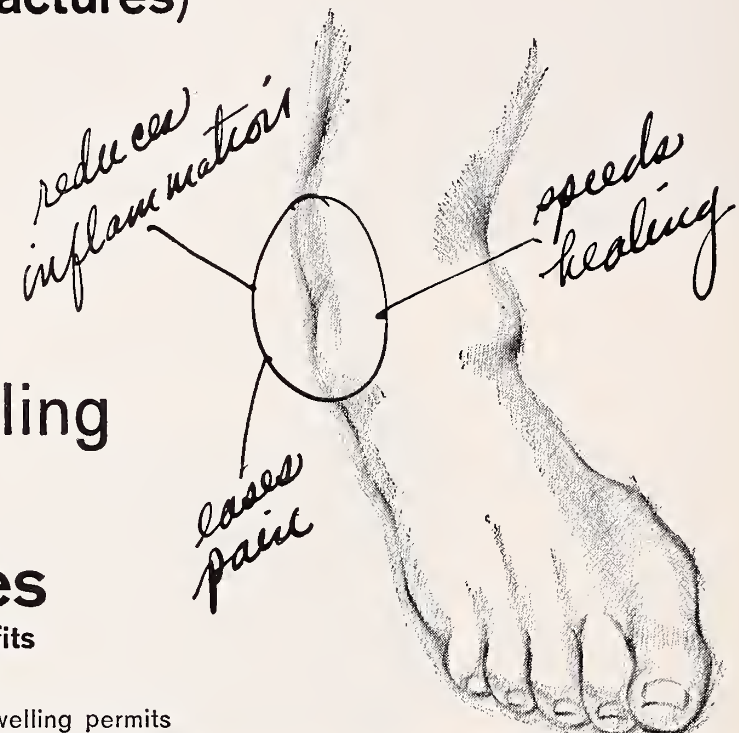

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Compatibilities: There are no known incompatibilities for Parenzyme [trypsin] or Orenzyme. Other medications may be given with these preparations, if indicated. In infection, appropriate antibiotic therapy should be used concurrently.

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P-2383/63 7/63

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ing egg white induced calcification of the skin. Subsequently the calcified skin was lost by moult. In suitably sensitized rats such calcific reactions can also be elicited selectively at predetermined sites (e.g. in the skin, muscles, joints, pancreas and many other areas in the body) by the intravenous administration of challenging agents that exhibit a particular affinity for certain organs. Very little is known about the mechanism of this new biologic reaction form and particularly about the possibility of its development under the influence of natural adaptive hormonal reactions, It is, however, clear from Selye's experiments on rats, that calcium mobilizing agents like parathyroid hormone and vitamin D together with some special property of some tissue can combine to produce metastatic calcification. If it occurs as a laboratory phenomenon, a search in the clinic would be expected to reveal situations of metastatic calcification also.

Metastatic calcification is in fact seen in diseases associated with chronically elevated blood calcium and phosphorus levels, in contrast with dystrophic calcification which occurs in diseases associated with local injury in which the serum calcium and phosphorus levels remain normal. Eisenberg and Bartholomew'[2] describe a case of extensive metastatic calcification that may represent the human counterpart of calciphylaxis. It was a case of calcinosis cutis in which both the history and laboratory findings pointed towards a diagnosis of recurrent pyelonephritis with chronic renal failure. It is now known that in renal failure one of the primary disturbances in calcium phosphorus metabolism is a fall in phosphate clearance which results in an elevated serum phosphate level. At the same time there developes a failure of calcium absorption[3] which may progress to the point where all calcium taken in can be found in the feces. The failure of calcium absorption, produces a tendency of the serum calcium level to fall and this in turn stimulates the secretion of large amounts of parathyroid hormone. The resultant increased bone resorption further elevates the serum phosphate level, at the same time barely maintaining the calcium level in the normal or near normal range. Even though the calcium level in the serum may not be elevated, the product of the calcium-phosphorus ion can be high leading to calcific deposits in kidney, stomach, lung, eye and the muscular layers of the medium sized arteries. As the precipitations continue, more calcium is drawn from the bones and the vicious cycle continues during which the bones develop osteitis fibrosa.

What the local chemical or physical differences may be that predisposes to calcium deposits in many diverse regions is not apparently known, but Selye has shown that cortisol does not prevent it, and that the hypophysis is necessary for the phenomenon to occur as well as the parathyroid glands. In the case reported by Eisenberg and Bartholomew, the sequence of events seemed to be an itch leading to scratch leading to the appearance of calcific lesions. The linear distribution of the calcific deposits in the scratch marks in areas where they had become extensive and confluent, suggest that mild trauma may have predisposed to calcification as it did in Selye's rats. Ordinarily such trauma does not lead to calcinosis cutis but apparently it may do so in secondary hyperparathyroidism of Eisenberg and Bartholomew's case just as it did in primary hyperparathyroidism in Selye's rats when they were challenged by hair plucking or egg white injections.

There appears to be no direct evidence to support the widespread belief that renal osteodystrophy is caused by metabolic acidosis found in chronic renal failure. Stanbury and Lumb[3] corrected the acidosis but obtained no beneficial effect or any detectable influence on either the serum levels or tissue balances of calcium and phosphorus. When they increased calcium absorption by sufficient amounts of vitamin D, only then did they succeed in overcoming the calcium absorptive defect and then the secondary hyperparathyroidism regressed. In Eisenberg and Bartholomew's case neither restricting calcium, nor phosphorus had any effect and only when they added sufficient doses of vitamin D to allow for adequate calcium absorption, did they succeed in reversing the state of calcinosis cutis.

The process called calciphylaxis is probably only a variant of what has previously been called metastatic calcification. An understanding of the metabolism of calcium is necessary for a proper management of this condition. If increased amounts of calcium are absorbed as occurs in milk-alkali disease[4] or in excessive amounts of vitamin D[5] intake, obviously one would seek to lower the calcium intake in which case reversal of calcification can be expected. In primary hyperparathyroidism metastatic calcification can be corrected by removal of a hyperparathyroid adenoma. In the secondary hyperparathyroidism of renal disease metastatic calcification can be reversed by increasing calcium absorption with suitable amounts of Vitamin D. Selye's concept of calciphylaxis, as he has produced it in the laboratory, has helped to bring into focus many diseases in which calcium metabolism plays an important role.

L.H.N.

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Medical Education At The Crossroads

The excellence of a medical school depends upon the quality of its students to much the same extent as it depends on the quality of the faculty. Anyone visiting the schools of the country finds general agreement that the real difference between a great and an ordinary medical school can be recognized not in the quality of the buildings, budget or faculty, but in the quality of the students and the real problem if we are to maintain excellence in the future doctor, is that we must have a supply of well qualified students.

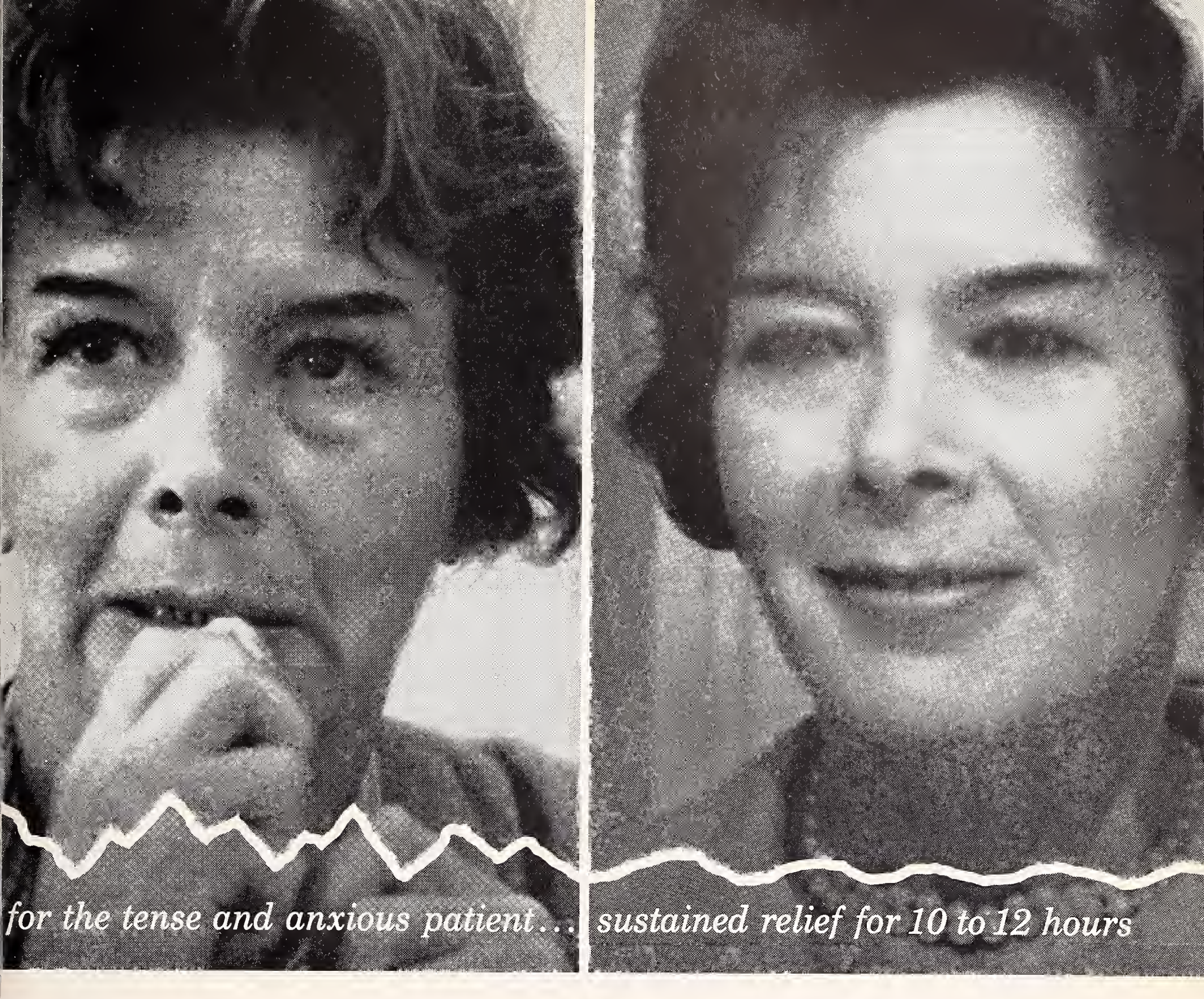
In spite of the fact that the total number of baccalaureate degrees awarded have steadily increased over the past decade, the total number of applicants to medical schools has hovered around 15,000 for each year. In spite of the increasing population and gradually increasing need for doctors over the next decade, there appears to be no indication that the number of college graduates seeking a medical education is growing.[1]

By contrast with the stationary number of applications to medical schools and therefore the stationary number of physicians, the number of Ph.D. degrees granted each year has risen steadily from 1920 when one-sixth as many Ph.D's. as M.D. degrees were awarded, to 1940 when they were equal and by 1970 there will be two to three times as many Ph.D. degrees awarded as M.D. degrees. This increasing number of Ph.D. candidates must mean a loss through competition of potential medical candidates, for, some who enter Ph.D. training will have considered the M.D. curriculums and will for whatever reason have rejected it. Even though there are still 1.7 times as many applicants to medical schools as there are places to be filled, we do find some disturbing situations about the quality of the applicants. For several years, colleges have been asked to assign a.b.c ratings to those graduates who are accepted in medical schools and the percentage of the students in the *a* category seems to have declined.[1]

Of greater significance is the high rate of drop-out of students during the first year of medical school for academic reasons. Such a tendency unless it corrects itself, indicates a change either in the quality of the student admitted or in the level of expectation of the faculty. But at the least, an increase in drop-out rate indicates an increasing discrepancy between the students ability and faculty requirements. The effect of the paucity of candidates or their intellectual capacity, will not be felt in those schools with the highest scholarship and high repute in which the number of applicants exceeds the acceptances by 5 to 10 fold. However, in those schools in which the ratio of applicants to acceptances approaches unity, a decline in mean quality will certainly and immediately be felt. If this is true, then construction of additional facilites and recruitment of additional faculty will not correct the impending physician shortage. One consequence of a decline in student quality will be to make the teaching less attractive than it now is and this could lead to its being carried out with less enthusiasm and success. Carried logically to its conclusion, if teaching deteriorates, then medical schools will become even less attractive to those students whom we all wish to attract. It is obvious that the alternative to such a mounting catastrophe is to make the medical career a much more attractive area of higher education than it is now. To accomplish this, we must know why it is that in the face of increasing population, of college graduates, of Ph.D. applicants, that the medical schools of the nation fail to attract sufficient applicants.

Stettin has analyzed two factors which appear to be outstanding as contributors to this failure. The first of these is purely financial, in that adequate predoctoral support for physicians is not available and that the immediate post-doctoral years yield at best near starvation wages. The contrast with the Ph.D. student in the physical sciences is striking. He obtains about 2400 and advances to 3300 with additional benefits for dependents in the predoctoral years. He can earn a further amount on the side. Virtually every predoctoral science student receives some form of financial support. In the post-doctoral years if the candidate does not secure an immediate job, fellowships are available which will pay a minimum of $5,000 plus $500 for each dependent plus $500 for each post-doctoral year.

By contrast the medical student gets no assistance other than access to some fund from which he might borrow. After he obtains his M.D. degree he is required to take a minimum of one year of internship to a maximum of perhaps five years during which he usually received board, lodging and pocket money. Formerly, scarcely any medical stu-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dent was married, and many finished their training in debt. While unpleasant and medieval, they tolerated this privation because they looked forward to a period of reward of the medical career which more than offset the hardship in securing the necessary training. But now with more than half of the graduates of medical schools married and with growing families, such a financial policy is fast becoming impossible. This must drive many college graduates away from medicine into greener pastures.

Clearly this is purely a simple matter of money and Stettin has estimated that to support 10,000 men and boys for an estimated seven years at medical school and internship would cost 350 million dollars, about what it would cost for one big space shot. The people will certainly at some near date have to decide whether they are willing to pay for continued superiority in public and private health. Actually the medical profession is the only one in which apprenticeship is not attended with a living wage. Plumbers, glassblowers and what have you, all pay their neophytes a living wage. The lack of consideration for the medical neophyte is a residue of the system of training which dominated all crafts before the industrial revolution, but persists as a vestige and an anachronism.

Stettin thinks another factor which may be operating to dismay potential medical students is the decline in the public image of the physician. While the scientiist has left his laboratory to become a leader in the community and a counsellor of presidents, coincidentally, the physicians image has not risen in the public mind. Much is being said about this problem and yet no data other than partisan opinion is available. It is true, some humor which often reflects the public mood reveals the physician in a derogatory light, but most of it shows the physician an able responsible scientist, devoted to his patients, keeping abreast of medical progress and in possession of miracle drugs to alleviate and cure human ills. In television the warm hearted dedicated physician, astute to human suffering and master of medical techniques is replacing the cowboy.

It is true that much needs to be done to elevate the image of the physician to what he truly is and has been in the past and surely will be in the future. He must come to be regarded as a leader of thought both scientific and social as well as a valued and trusted servant of humanity. Such an image would help to attract into medicine the kind of young people we wish to attract. But in addition, to really succeed in this task we must assure them an adequately secure financial position during the period of training. If we do this, the shortage of applicants to medical schools will disappear and so will the limitation on the growth of our medical schools.

L.H.N.

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Myth Or Reality

> *Geronte*: *Yes, I have but one daughter and I would never get over it if she were to die.*
> *Sganarelli*: *Do not let her do anything of the kind. She must not die without a prescription of the physician.*
>
> —Moliere, *The Physician In Spite Of Himself*

During the past ten years, a new discipline of Social Dynamics has grown. One of the areas of its endeavors has been an exploration of the attitudes of the public towards their doctors and towards the medical profession as a whole. One of the earliest such studies was conducted by Dr. Ernest Dichter for the California Medical Association and first appeared in *G.P.* in October 1951. Trained researchers went into a typical American community and with tested psychological techniques studied both sides of the physician-patient relationship. Dichter wanted to know what people think of their doctors and why. We, of course, looking at it from our desks, are not surprised that he found that the family doctor occupied the vital role in present day relationships between the medical profession and the public. What people really wanted was a family doctor who will accept total continuing responsibility for administering or when necessary, securing and supervising the best available care for all medical and surgical conditions. This he found was the ideal doctor, *who does exist* and the idea that the ideal doctor is gone or has drifted away from the people was a pure myth.

Subsequently, a number of relevant studies have been completed, some by experts for the A.M.A., and a most recent one conducted by the Opinion Research Corporation (O.R.C.) at Princeton. All the studies were designed especially to determine the image of the general practitioner (G.P.). The questions asked were: (a) Is our American system of medical care basically sound; (b) How essential is the part that the G.P. plays in this system?; Would the results obtained be consistent with the opinions held by a majority of the people of this country? The results revealed a strange paradox. On the one hand, was the attitude of the people to their own doctor and on the other, peoples attitude towards the profession generally. Most people have a high regard for their own doctor. They believe medicine in America is the best in the world, that their doctor is efficient and competent in pursuing his goals. They are satisfied if they obtain results, and are not too concerned about the bedside manner. In short, the most outstanding characteristic of the publics medical demand is for sheer competance on the part of their physicians. They believe that today's doctors are better than ever and the idea that the old fashioned G.P. was the best doctor ever is a pure myth.

The image of the profession as a whole among the public, is quite the opposite. The medical profession in America in 1963 is carrying on its practice of healing in an atmosphere of public criticism and hostility. Nearly every popular magazine turns periodically to the subject of health and medicine because editors know that this is one of the most important and interesting subjects in the life of every human, that such articles will be read and the circulation will go up. Almost invariably however, an element of criticism creeps into such stories. Two years ago, *Harpers Magazine* took up the subject in a special issue which claimed at the same time that American medicine is the best in the world and later on that millions of people are bitterly dissatisfied with the medical care they are getting. This may not be as paradoxical as it sounds for there are nearly two hundred million people in this country, and a few million could be an insignificant minority. But logic is not a necessary ingredient in the press. Nevertheless, one must heed this attitude for it means that while criticism is rarely directed at the doctors, it is frequently directed at the profession.

What do people really want of their doctor towards whom they are strongly attached and favorably disposed. Apparently from the ORC survey, it is clear that people are not too much impressed by a good bedside manner nor even by their personal relationship with their physician. They are primarily interested in competence and results. People apparently buy medical care as they buy a commodity. They want results first when they set out to select a physician. The average person is thinking of results, and not even financial considerations often enter the picture. They might even go to a physician merely because he charges a higher fee, accepting this as a good evidence of his competence! Out of every hundred people interviewed only fourteen combined human relations and financial considerations as the important one in choosing a physician. People will stay with a doctor as long as they have confidence in his ability and skill. In short, the results sharpen the image of the physician as pre-eminently the Medical Problem Solver. The former role of the physician as a minor deity, a wise family friend, is on the decline. The public is strongly function-oriented. "They want skill, not sooth-saying."

To develop a favorable public image, it is the profession, that must organize projects for the public welfare. The individual doctor already enjoys high esteem, it is the profession that does not. This means the idea that "the public relations job of medicine must be done in the local doctors office" is wrong, and is pure cliché. One step by the A.M.A. of establishing a research institute for medical science is a welcome move in this direction. But if the general practitioner enjoys high esteem, it is because he is keeping abreast of medical progress, without which he could not give the best results and retain his high esteem. It should spur him on to courses, and lectures and reading to maintain his excellence.

It is welcome to see what some of the discredited myths are. Some of them have been mentioned already, others follow. "Many people are unhappy with medical care"—false. "Doctors don't care about people anymore"—false. "People look to the group, the plan or the clinic for good medicine"—false. "The fee for service system is on its way out"—false. "People who receive care from the government prefer it over all other systems"—false. "The majority of people want the government to take over medicine"—false. "Doctors are all money mad"—false. "Patients expect the doctor to be God"—false. "The general practitioner is no longer important in modern medicine"—false.

The material from which the above results were derived came from a half dozen books on the physicians image including the most recent 200 page contribution to knowledge on this subject. It reveals that the family physician has the most favorable image, the greatest reputation asset, of any profession. Now let organized medicine capitalize on these assets in a way that will enlist the support of our greatest ally—the public. How far the image of the general practitioner has risen in the past hundred years can be seen from the caption at the head of this editorial which reveals what it was in Moliere's time.

L.H.N.

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THE PRESIDENT'S PAGE

Medicine And The General Practitioner

THIS is the month when your President is overwhelmed with meetings of all kinds, not only the county Medical Association meetings which he feels obligated to attend, but such meetings as the Archdiocesan Council of Catholic Nurses, and the American Academy of General Practice (Connecticut Chapter).

To be told, as I was at the recent meeting of the AAGP in Hartford, that there wasn't a single General Practitioner below the age of 40 practicing in the city of Hartford is startling if only approximately true. Coupled with this is the prevailing statistic that of all medical students only 16 to 18 per cent intend to do General Practice. Carried to its logical conclusion such a trend foreshadows the day in the not too remote future when medicine will be practiced exclusively by specialists. Even if such statistics be disproven, it surely symbolizes so radical a departure from the aims which formerly motivated most medical students as to give us pause.

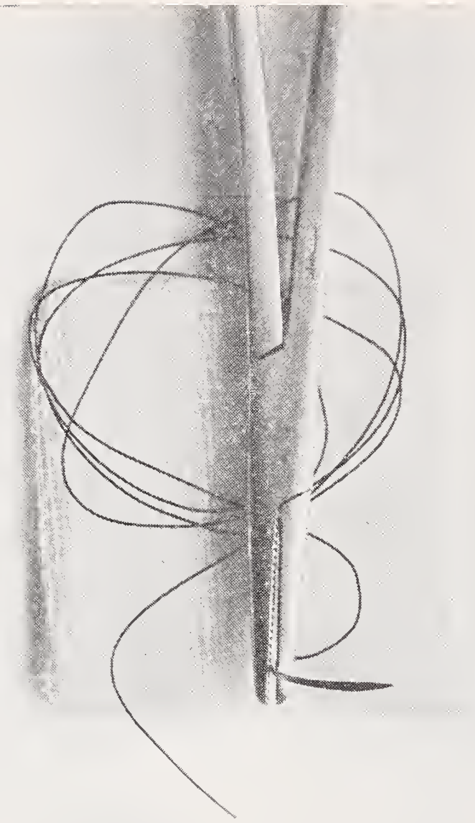
We are all aware of the tremendous increase in the number of specialists of all kinds. If we've given it any thought at all, it seemed only the natural response to a public demand for better trained doctors. But to carry so good an intention to the extreme that we seem to be carrying it, namely all specialists and no General Practitioners would seem to be an out of proportion distortion.

I suppose it is only natural for the aspiring medical student to aim high in the attainment of his goal. It is also to be expected that specialization offers such fringe benefits as less arduous toil, greater prestige, even greater emolument. But these have always been the goals of medical students. It is only now, in an era of unprecedented prosperity, that more and more medical graduates find it possible to continue post-graduate training. Thus more aspirants can attain the required credentials as specialists. In the past it was the unusual student or intern who married while still in school or internship. Today students, interns and residents, do not hesitate to take on the burden of wife and family. So much so that internship and residency programs must provide not only excellent approved training programs but living quarters for wives and children as well.

Meanwhile, what of the public and their need for family doctors? When the patient needs a specialist is he the one to choose the specialist he needs? What specialist does he need? Who should choose the specialist he needs? Let's face it, what is the percentage of illnesses in which the patient really needs a specialist?

What should be obvious has somehow become obscure. The first thing a sick patient ought to do is call a family doctor, the general practitioner. It is the family physician who should decide whether a specialist is needed and what particular specialist is needed. The patient who has a good and friendly relationship with his family doctor can trust him for advice when a specialist is needed. Specialization is not entirely the fault of the medical profession. A demanding public must take its share of the blame if the situation regarding the family doctor is getting a little out of hand. It is the general public that has placed a premium on specialization. Somehow the public has either lost its way or been led astray in the matter of how best to use the medical services available. Steps should be taken to set things back on the proper road.

MORRIS P. PITOCK, M.D.



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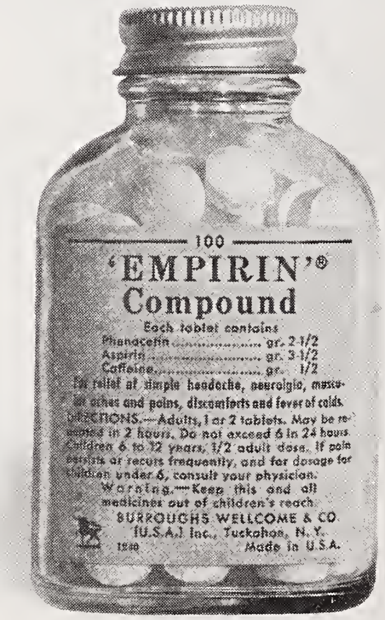
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Health Care Of The Aged

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■ Health care in general, and of the aging in particular, has become a matter of increasing interest and importance to many individuals and groups—not the least of whom are the members of the medical profession. Equable and proper solutions to the many problems posed are essential to the physicians, to their patients and to the public as a whole. Doctors should take part in the deliberations and the decisions which must be made. They should use whatever background material and facts are available if they are to assume their proper role as guides in these perplexing times.

The problems of health care of the aged are complicated enough when they are considered purely professionally and scientifically by physicians, nurses, hospital administrators and other related professionals in health care. However, when social, economic and political factors are also taken into consideration, the issues arouse attention and emotion far out of proportion to the basic medical problems. Unfortunately, the purely scientific and professional factors, which are within the particular province of the medical profession, cannot be separated from the social and economic considerations, inasmuch as no one of them can be truly isolated and each affects the other. Political overtones complicate decisions even more. Proposals have become identified as pro- or anti-administration, as liberal or conservative, as "states' rights" or as responsibility of federal government. As a result, consideration of the actual health care of the aged almost becomes a secondary issue to the philosophical debates on the social structure of the nation.

Physicians, both individually and collectively, have become so identified with the whole discussion of the care of the aged that they are also involved politically, socially, and emotionally, whether they want to be or not. Suggested programs have now become associated with or opposed to "socialized medicine."* As a result, consideration of proposed solutions are in the danger of being over-simplified to a choice, on the one hand, of complete medical and hospital care which is financed and run by the federal government, and, on the other, of the preservation of existing programs of private practice, voluntary hospitals, rugged individualism and private enterprise.

Misinformation and misinterpretation of material and of conflicting statistics have only added to the confusion and to the differing points of view. These have resulted in an unfortunate but understandable series of statements and counterstatements, with the resultant establishment of rigid positions on both sides of the issue, neither of which may be consonant with the facts.

The significant part in this disagreement is that, in all probability, the vast majority of those involved—physicians, hospital administrators, industrial, labor and political leaders—is not in substantial disagreement over the overall objectives. Most will agree that the aged should be adequately cared for and that there should be due regard to the self-respect and to the individual needs of the aged. It is also safe to presume that a great majority of those disagreeing with the present position of organized medicine has respect for the dedication and interest of the individual practitioners of medicine, and supports the voluntary system of health care and of private enterprise in this country. There is little disagreement on these facets of the problem. The difficulty arises in reaching agreement on the best method of providing health care for the aged.

The purpose of this paper is to present background information and to suggest principles upon which a health care program for the aged can be based. Physicians are in a far stronger position when they debate upon principles rather than upon the merits of individual congressional bills.

There are a number of basic facts that need to be understood if a realistic program for the health care of the aged is to be developed or advocated.

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* The definition of socialized medicine as presented by Webster's New Collegiate Dictionary (3rd edition—1961) is as follows: "Socialized Medicine—Administration by an organized group, a state, or a nation of medical and hospital services to suit the needs of all members of a class or all members of the population by means of funds derived from assessments, philanthropy, taxation, or other sources."

The Health Insurance Plan of New York City, the United Mine Workers system for providing medical and hospital care, the Community Health Association of Detroit and the large Permanente program of the West could fall within the scope of this all-embracing definition.

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1. *A definition of "the aged" is necessary for any comparative statistics or understanding.* For convenience and simplicity, the terms "aged" and "aging" are used to mean persons of sixty-five or older.[1] This usage admittedly fails to take into account the individual differences in the extent to which persons sixty-five or over are "aged" or "aging." It makes no allowance for those persons under the age of sixty-five who may be aging more rapidly than other persons sixty-five or older. This definition, however, lends itself to comparable actuarial studies.

2. *The aged represent a proportionately as well as a numerically significant portion of the population.* In 1960 there were 16,559,600 persons over sixty-five in the United States. This was 9.2 per cent of the population.[2] It is estimated that by 1980 about 10 per cent of the population—approximately 24.5 million persons—will be sixty-five years old or older.[1] 9.3 per cent of the Connecticut population or 236,000 persons were aged in 1960 in a total population of 2,535,234.[2]

3. *The cost of providing health care for the aged is disproportionately high in comparison with those below the age of sixty-five.*[3] Aged individuals are admitted to hospitals more frequently and stay longer. They are the predominant users of nursing homes and other long-stay institutions. They require and use a greater volume of physicians' services. They spend more on drugs. It is only in dental services that the aged use less than the population as a whole. If the actual cost of health care of the aged group were to be met without subsidy, insurance premiums for the aged would be increased from one and a half to three times the premiums for those under sixty-five.[3]

4. *All evidence indicates that the cost of health care will continue to increase.* This will be particularly true for hospital care, which is steadily increasing 5 per cent to 7 per cent a year.[4] The increase may be less for drugs and for physicians' services.

5. *A large number of the aged have only limited resources by which they can finance their health care.* This is a subject about which a great deal has been written, but with no agreement being reached. However, regardless of the nature or source of the statistics quoted, there is a significant number of the aged who have only a limited income. As they grow older, fewer are able to earn wages. It is true that assets owned by those over sixty-five have a higher value than those owned by individuals under sixty-five.[5] However, these assets are represented primarily by home ownership which can be tapped only by mortgage or sale. Dependence upon children or grandchildren is a variable factor that is difficult to evaluate legally, philosophically or economically. The aged who face economic problems differ from the younger group facing similar financial burdens mainly in the fact that they cannot expect to recoup their losses or pay off their debts through future employment. Their income and their assets are fixed and provide little potential for adjustment in the event of inflation or of increasing health care costs.

6. *The high costs for health care of the aged coupled with limitation of income and assets require supplemental financing to cover the total cost of health care for an appreciable number of aged.* There is no such thing as "free care"—payment for care must come from some source. Subsidy for hospital care currently and historically comes from higher rates for private patients, from increased premiums of third-party agencies, from governmental funds, and, to a decreasing degree, from endowment funds and charitable contributions.

The traditional method of higher charges to private patients and to third-party payors to help cover those less able to pay is coming increasingly under question. Private patients are becoming resistant to the "Robin Hood" philosophy of charging. Commercial insurance has traditionally adjusted its rates to the experience of the specific group covered and has not subsidized the aged at the expense of the younger group. Blue Cross, on the other hand, has advocated the philosophy of community rating and of providing overall service benefits. This requires the fixing of a premium for the overall community which contains a high percentage of poor experience risks (the aged). Thus the younger subscribers have subsidized the aged. Walter McNerney, President of the Blue Cross Association, has stated,[6] "The prepayment agencies acting alone, despite their close working relations with hospitals, despite their practices of community rating (rating so that low risk groups and employed groups help high risks groups including the aged) and surcharging merit rating accounts, cannot create enough new purchasing power for the aged, given the competitive nature of the market."

Increasing resistance of private patients and third party agencies to higher rates to cover poorer patients and diminishing charitable funds leaves governmental subsidy as the only logical or possible alternative for the supplemental financing of health care for the aged unable to finance the total cost themselves.

7. *An indeterminate number of the aged can finance part or all of their health on a prepayment basis.* The number will vary dependent upon the criteria established, the responsibility required of children and grandchildren, and the availability of adequate insurance programs. It will also vary markedly in different parts of the country—depen-

dent upon the type of population, income, living costs, and percentage of the population covered by prepayment insurance. Connecticut is not typical of the country as a whole because of its high per capita income but it does illustrate the fact that many of the aged have some resources to finance at least a portion of their health care costs. In 1960, the United States census listed approximately 236,000 Connecticut people aged sixty-five or over. Of this total, approximately 27,000[7] aged were living in institutions or were otherwise having their medical care needs met by governmental assistance. Of the 209,000 balance, Blue Cross had enrolled 139,641,[8] or almost 70 per cent of the eligible aged population.

The total number of aged that have hospital insurance of some sort or other — or who have resources to pay the full cost of hospitalization—cannot be accurately determined, but, regardless of the type of insurance or the means by which it is financed by the elderly individual, the fact remains that a significant number of those over sixty-five in Connecticut are presently able to pay a portion of their health care premium costs. It is equally true that even a wealthy state like Connecticut, with a strong prepayment and commercial insurance program, still has a substantial number of aged citizens who cannot possibly pay the full cost of their care.

8. *The present voluntary system for providing medical and hospital care in the United States has also available adequate mechanisms for the distributing of funds for financing of this care.* This can be done efficiently and economically by voluntary and commercial agencies, with provision for such quantitative and qualitative controls as would be considered desirable. The Department of Defense Dependent Medical Care Program (Medicare) which includes approximately 3.5 million individuals with an annual expenditure of over $76,000,000 is proof of successful partnership of government and existing community agencies. This program has been financed since 1956 by the federal government and implemented throughout the country by Blue Cross, Blue Shield and commercial insurance agencies, with an administrative overhead expense during the past fiscal year of approximately 2.5 per cent[9] It has not been necessary to establish an additional large central federal bureau to administer this program.

9. *The source of governmental funds required to finance the necessary subsidy of the costs of health care of the aged for those unable to finance the total cost themselves is secondary in importance to the type of program and the means of implementing the program.* If it is accepted that federal funds are necessary for subsidy, the source of the funds may be from income taxes, corporation taxes, sales taxes, gas or amusemenet taxes, taxes upon wages—or any combination thereof. No type of tax escapes being discriminatory under given situations and none can be shown to be uniquely appropriate to financing of the health care of the aged.

The source of governmental funds and the mechanism by which they are collected is one thing. The actual program of providing medical and hospital care to the aged is another. A proposal that the social security mechanism be the vehicle for securing a major portion of the federal funds necessary for the health care of the aged does not make mandatory that the Department of Health, Education, and Welfare should, in addition, be responsible for the implementation or the operation of the program.

This is an important distinction. Those opposing the King-Anderson Bill have combined attacks on the program of implementation by a central bureaucracy in Washington with attacks upon the soundness of the Social Security system. This has placed many physicians in a vulnerable and misunderstood position. They may have very legitimate reasons for opposing a central bureaucracy for providing hospital care—but are doctors really opposed to Society Security? Can organized medicine justifiably object to the principle of Social Security and to the principle of obtaining funds through a payroll tax? Is there anyone besides extremists and zealots—such as are found in the John Birch Society —who seriously advocates that the Social Security program be abandoned? Yet this misunderstanding currently exists, as witness the battle by newspaper interviews, by news releases, and by past newspaper headlines between the President of the United States and the President of the A.M.A.

The nine points outlined above provide a background for consideration of the development of a national program for the health care of the aged. It is suggesed that such a program be based upon the following premises:

A. There is a serious problem in the financing and in the implementing of the health care of the aged in this country. This problem can be expected to become greater.

B. A great number of the aged in this country cannot afford to finance their health care in its entirety from their own resources. Subsidy will be necessary, and there is no realistic alternative to a federal source for this financial subsidy.

C. The federal government should be primarily concerned with the setting of standards for the disbursement of governmental funds as well as the provision of funds to pay for the appropriate health care. The method of obtaining funds to aid the medically indigent aged is a political and financial, not a medical, problem. It should be from any type of a tax or a payroll deduction that seems appropriate to the federal government. A single method of raising funds is not necessarily indicated. Any combination may be appropriate. Payroll deduction and the use of the Social Security mechanism is a perfectly logical approach for part of these funds—but should not be expected to meet all needs.

D. The use of existing private and voluntary agencies for the provision of health care and for reimbursement should be used to the greatest extent possible. Blue Cross, Blue Shield, and those commercial insurance agencies that already are working with hospitals and physicians should be utilized in preference to the establishment of a new government bureaucracy for the implementation of any such program.

E. Governmental financial assistance should be geared to provide for those who are in need. This should be on a sliding scale. Individual need will vary and a maximum of opportunity for self-sufficiency or self-participation should be available. A mechanism, such as payroll deduction under Social Security, is one appropriate means by which a great many individuals can contribute during their working years for an appreciable part of the cost for their health care when aged—the rest of the cost being borne by themselves or by the government if the need can be authenticated. Any means tests should be reasonable, simple, and not punitive.

Whether a means test is required—no matter how understanding or flexible in its administration—or whether there is universal eligibility for hospital care—regardless of the income or assets of the aged—is a fundamental issue which must be determined before any program can be established. Either every individual over sixty-five is entitled, by right to being alive and sixty-five, to the benefits of the hospitalization program or those individuals over sixty-five who can afford it should pay part or all of the cost of their health care. The decision is not easy. Social philosophy, setting of eligibility standards, equitable and efficient screening and total costs enter into the decision.

If all persons over sixty-five in Connecticut were to have a reasonably complete insurance program of hospitalization in general hospitals and in nursing homes, there would be an individual annual cost of at least $120 per person. This would amount to 236,000 x $120 or $28,320,000 a year. This is over $56,000,000 for the biennium for the State of Connecticut and is a fair estimate of the cost of hospitalization alone for all of the aged in Connecticut. Almost 140,000 individuals over sixty-five in Connecticut are covered by Blue Cross and an indeterminate additional number have commercial insurance and/or "Connecticut 65." They or their families are currently paying the cost of this through their own resources and there is no evidence that many are encountering financial difficulties. Studies in nine general hospitals in Connecticut reveal that approximately 70 per cent of the patients over sixty-five have a major portion of the hospital bill paid by Blue Cross or commercial insurance and only 14 per cent are directly self-pay.[10] No convincing evidence has yet been found in Connecticut hospitals that the self-pay aged or those with insurance have any more trouble than any other age group in utilizing hospital services or in paying their hospital bills. It must be emphasized that Connecticut is unique with its high per capita income and its high per cent of the population covered by insurance. The Connecticut experience would indicate that in Connecticut, at least, a major portion of the total cost of hospital care is currently being financed by the aged and their families. This may also indicate that with sufficient per capita income and with satisfactory prepayment programs, government need not assume total responsibility for providing the cost of care. It lends weight to the suggestion that there be a flexibility of approach to the problem based upon variation of ability to pay.

There does not appear to be any inconsistency in maintaining the philosophy that those aged who can pay part or all of the cost for hospital insurance should do so, and in providing the opportunity to individuals to set aside the necessary funds to do this through the mechanism of Social Security. Whether money for hospitalization insurance for the aged is obtained from savings laboriously accumulated, from a private annuity fund, or from a periodic deduction from wages during the working years through the Social Security mechanism, the individual himself is directly participating in the financing. This would seem to be socially desirable.

Discussion

It is not the purpose of this paper to debate the relative merits of the Kerr-Mills Bill or the King-Anderson Bill. Both have very serious deficiencies. Regardless of the enthusiastic proponents of each, neither cannot be expected to meet all of the problems presented to the aged, to the physician, to the hospitals, or to the financing agencies. The difficulty that legislators and the general public are encountering today is that the arguments that are being presented by the proponents or the opponents of any specific bill are at wide variance. There is little or no acceptance by either party that there may be some merit, honesty, or good will on the part of the opposition. It would be more profitable to measure each bill against agreed-upon principles and objectives and to recognize any advantages and deficiencies in each rather than to favor exclusively one or against the other. It should not be an all-or-none proposition.

The King-Anderson Bill would require a central bureaucracy or implementing agency in Washington, and would not cover all of those aged that are in need. It has not been convincingly demonstrated that the estimated costs for implementing the King-Anderson Bill are realistic. The opposition to the utilization of the Social Security Agency as the implementing body of the program has been clouded by attacks upon the fundamental philosophy underlying Social Security as well as its possible use as a fund-raising mechanism for health care of the aged.

The Kerr-Mills Bill has been equally misunderstood or misinterpreted, inasmuch as it is being presented as the definitive answer to the problem of health care of the aged. The national Kerr-Mills Bill presents the advantages and the disadvantages of individual state determination of standards of eligibility, benefits, quality and administration. These will vary dependent upon individual state finances and upon local sophistication in health and welfare matters. Partisan politics may well interfere with appropriate solutions to pressing problems and statistics of utilization are completely confusing. Figures are not comparable because there is still no guarantee that such basic statistical standards as are available are being used.

The public and the medical profession can expect the King-Anderson Bill and many substitute bills to be introduced at the next session of the Congress. It is suggested that they should all be studied on the basis of the principles outlined in the previous discussion:

1. There is a problem which can be expected to get worse.

2. Many aged cannot afford to finance their total health care themselves.

3. The federal government should be concerned with the setting of standards for the disbursement of funds as well as the provision of the funds.

4. Existing private and voluntary agencies should be used for the provision of health care.

5. Tax funds should be utilized to help those in need.

A potential solution has been advanced by the American Hospital Association and the National Blue Cross program. This involves a nationwide Blue Cross hospitalization program available to all individuals sixty-five years or older. The program is such that governmental funds may be used as subsidy for those aged unable to afford the cost, but the oportunity is offered to those able to pay part of the premium to do so to the limit of their ability. The program is based upon the assumption that the existing voluntary agencies can most efficiently and economically implement, using a governmental funds subsidy, a hospital care program for the aged. An implied correlary is that, if the implementation of the program should be the prerogative of the voluntary agencies, the method or methods of raising the necessary governmental funds for subsidy of those unable to pay should be the prerogative of the government. This may well prove to be the basis upon which a program can be developed that will preserve the principles of the opposing forces, allow collection of part of the funds through Social Security, retain implementation through voluntary and private agencies, and still permit an evolutionary development unaffected by synthetic issues, questionable statistics and misdirected emotion. It will depend upon an intelligent and understanding cooperation between individual Blue Cross plans, independent voluntary hospitals, Blue Shield plans, ruggedly individualistic physicians and governmental agencies. Some such program must, of necessity, succeed if the continuing social, economic and political pressures for health care in this country are not to force a complete governmental system as an alternative.

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A Systematic Approach To The Therapy Of Severe Pre-Eclampsia And Eclampsia

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■ The extremely significant reduction in maternal mortality in the United States, from over 60/10,000 live births in the 1920's to about 5/10,000 live births in the 1950's has done much to lull the obstetrician into a sense of false security as regards maternal mortality in association with toxemia of pregnancy. In 1956, there were over 1,000 maternal deaths in the United States. The ratio of toxemia deaths was found to be 1.1 per 10,000 live births, while that for all maternal mortality was 4.1 per 10,000 live births. Therefore, just over 25 per cent of all maternal mortality was in association with toxemia. It is interesting and very important to note that there was a higher maternal mortality rate with severe pre-eclampsia than with actual eclampsia. This point has been made many times, but is all too often not fully appreciated. There were 240 severe pre-eclamptic deaths and 213 eclamptic deaths. It has been thought for the last many years that about 25 per cent of eclampsia occurs postpartum, and this figure is still valid because in 1956 the post-partum eclamptic death rate was 22 per cent. There were 167 antepartum and intrapartum and 46 postpartum eclamptic deaths.

Despite a colossal amount of time spent by many, many investigators, little more is known about the etiology of toxemia now than at the turn of the century. However, recent work by Hunter et al., is encouraging and might well bear brief summary here, as it may eventuate in a new therapeutic modality. A heat-stable polypeptide has been isolated from the decidua and amniotic fluid of toxemia patients. This is a vasopressor agent which is not blocked by adrenogenic blocking agents and also apparently has an oxytocic effect. The substance is called hysterotonin and is considered to be an end-product of enzymatic action. It is probably located primarily in the decidua. It differs from the vasopressor substance of the kidney, renin, which is heat-labile. Angiotonin, a product of renin, is dialyzable but hysterotonin is not. If these findings are confirmed and extended, further advances in polypeptide chemistry might offer a new and sound therapeutic approach to the problem of toxemia.

The electron microscope recently has been employed in the pathological study of all the renal diseases in pregnancy and the findings which are characteristic of toxemia, are pronounced swelling of the glomerular endothelium which distorts and occludes the capillaries, and fibrinoid disposition between the basement membrane and endothelium and the endothelial cells themselves. These are the details of the glomerular findings, (ischemia, a bloodless and swollen appearance and fibrinoid deposits) characteristically seen by the light microscope. To date there has been no direct correlation between severity of kidney lesions and clinical manifestations. It is possible that further application of the electron microscope will solve this apparent dilemma.

Toxemia of pregnancy may be a specific entity, but there is certainly no absolute proof of this at this time. At the moment it is probably best to consider toxemia as a symptom-complex consisting of one or more of the following: (1) hypertension, (2) edema, (3) proteinuria. While there is no uniformity of opinion, the general concensus seems to be that the diagnosis of toxemia can be established when any one of the three following criteria are met:

I. *Hypertension.* Systolic pressure of 140 mm. Hg, or more, or diastolic pressure of 90 or more, or an increase in the systolic pressure of 30 mm. or more, or an increase in the diastolic of 15 or more in a pregnant woman who was normotensive prior to the 20th week of pregnancy. These readings must be observed on two or more occasions at least 6 hours apart. The specified increases mentioned above, in hypertensive patients, establish the diagnosis of superimposed acute toxemia.

II. *Edema.* The diagnosis of toxemia on the basis of edema alone can be made only when there is edema of the hands and/or face, present in the morning and clinically evident.

III. *Proteinuria.* The diagnosis of toxemia on the basis of proteinuria can be made when clean-catch or catheterized urines, on 2 or more successive days, show an unequivocal cloud of protein precipitated by any recognized test, or the excretion of 0.5 gm.

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or more of protein per 24 hours, for at least 2 consecutive days.

Pre-eclampsia can be classified as *severe if any one* of the following signs or symptoms is present. If none are present, the pre-eclampsia should be classified as mild:

I. Blood pressure of 160 or more systolic, or 110 or more diastolic, on at least 2 occasions 6 hours or more apart, with the patient at bed rest.

II. Proteinuria of 5 gm. or more in 24 hours (3 or 4 plus on qualitative examination).

III. Oliguria (400 cc. or less per 24 hours).

IV. Cerebral or visual disturbances.

V. Pulmonary edema or cyanosis.

The differentiation between severe pre-eclampsia and eclampsia is a fairly arbitrary one, depending on the presence of coma and/or convulsions. Frequently the patient with severe pre-eclampsia is actually sicker than those who convulse, so that the clinical differentiation is not necessarily a prognostic one. Furthermore, there is no direct correlation between the level of blood pressure and the severity of the disease.

The classification of acute hypertensive diseases of pregnancy into definite compartments as fostered by the so-called International Classification, the classification by the American Committee on Child and Maternal Health etc., is pedantic and of little clinical value. Toxemia is a continuum and thus defies clear-cut compartmentalism. The treatment of mild pre-eclampsia which is routinely handled on an ambulatory basis, is not to be considered in this presentation. One might say in passing that if mild pre-eclampsia is treated adequately there would be very little severe pre-eclampsia or eclampsia. Probably no patient can go from a normal state into a condition of severe pre-eclampsia or eclampsia without sufficient signs or symptoms to signal grave danger ahead. The only possible exception might be a patient with chronic hypertensive disease. The adequate medical management of the severe pre-eclamptic, the eclamptic or the patient with chronic hypertensive disease and superimposed toxemia constitutes a very challenging problem. The regimen that is in current use at our hospital for the treatment of severe toxemia will be presented.

Death in association with toxemia usually results from either a cardiovascular accident, cardiac failure, renal failure, or asphyxia in association with convulsions. This means, therefore, that marked elevation of blood pressure, convulsions, pulmonary edema, marked albuminuria or anuria are of great prognostic import. Using these as points of reference, an attempt will be made to outline a practical therapeutic regimen designed to prevent the occurrence of death due to any one or all of them. Please bear in mind that we are aware of the fact that this is not treating a disease entity, but merely treating a series of interrelated but possibly, at times, quite independent signs and symptoms. The fallacy of much of the therapeusis of toxemia to date has been and is due to the fact that the limitations of each modality of treatment are not always recognized. For instance, diuretics are not primarily hypotensive agents. They may lower the blood pressure slightly, but, if they do at all, it is probably by reduction in total body fluid. Magnesium sulfate acts at the neuromuscular junction to reduce muscular excitability and any action the magnesium ion has on blood pressure is transient and certainly a relatively unimportant one. Magnesium sulfate causes a transient rise in sodium excretion by increasing glomerular filtration rate and increasing renal plasma flow. Hypotensive agents are extremely effective in lowering blood pressure, but there is no reason whatsoever to believe that they do anything but this, i.e., they do not necessarily alter the course of the toxemia in any significant way, nor do they necessarily lead to an increase in fetal salvage or decrease the incidence of convulsions. One author states that they lead to a decrease in stillbirth, but they do not lead to a decrease in over-all fetal and perinatal mortality. This seems to be a contradictory statement. As we shall see, even the importance of a low sodium diet is suspect.

Weight Limitation And Salt Restriction

There is still nothing magic in weight limitation as regards the prevention of toxemia. However, there is little doubt but that weight gains of over 20 pounds during the course of pregnancy are associated with a significant increase in the incidence of toxemia.

It has been time-honored that salt restriction is of importance in the latter part of pregnancy, particularly in those who are gaining weight rapidly (more than a pound a week) or who have a borderline blood pressure. The author would like to take this opportunity to caution against the blind acceptance of a very recent preliminary report. Mengert administered diets of 10 to 11½ grams of sodium chloride and 0.9 to 1.7 grams of sodium chloride daily, alternately to 48 consecutively admitted patients with acute, vasospastic toxemia of pregnancy. No discernible effects on the clinical course of the toxemia were noted. Experience over the years is so overwhelmingly to the contrary that it is extremely difficult to accept sporadic articles that minimize either the importance of low sodium diets or weight control. We are unhappy if our patients gain more than 20 pounds unless they are under-weight at the onset of pregnancy. Many grossly over-weight women should actually reduce during pregnancy. When a weight gain of more than a pound a week is sustained a dietetic consultation is urged. The usual diet is 1500 calories with sodium content of 0.5 to 1 mg.

Diuretic Therapy

Diuretic therapy is usually initiated in the ambulatory patient, and probably should be, in the presence of significant edema or rapid weight gain. Its use may help in determining 4 to 5 days earlier than otherwise which way the process is going. Bed rest, per se, is usually a very excellent diuretic agent, for in a matter of 24 hours to 48 hours this alone in an edematous patient frequently leads to a weight loss of from 4 to 6 pounds. This should be borne in mind, as much of the diuresis that ensues soon after hospitalization may well be given credit to a diuretic or change in diuretic, rather than to the bed rest, thereby leading to a possible sense of false security as regards the effectiveness of the diuretic agent.

There are so many new oral diuretic agents on the market that one cannot keep up with all of them. The ingenuity of the pharmaceutical houses supercedes or excells the memory of the busy clinician. When such is the case, as it all too frequently is, it is by far best to stick with a drug whose effectiveness is known through the physician's personal experience with the drug, rather than trying each new agent as it is placed on the market. There has been, in reality, no tremendous advance in the last two or three years in oral diuretic therapy. With this rationale in mind, we have more or less limited our medication to chlorothiazide (Diuril). There is no apparent advantage in the use of hydrochlorothiazide; except that the dosage is smaller. Oral chlorothiazide is usually effective in a matter of 24 hours to 48 hours. The doses may be carried up to 1,000 mg. twice daily. If the situation seems desperate enough, chlorothiazide can be given intravenously in doses of 500 mg. and repeated in 12 hours. The peak of urinary excretion from the intravenous injection is from 1 to 4 hours. It is a hyperuricemic agent and this should be remembered when evaluating uric acid levels.

When chlorothiazide is administered over a long period of time (many weeks) or in high doses, one must be on the outlook for potassium depletion. Nausea is usually the first sign of hyponatremia. Kaon or potassium triplex should be given. A teaspoonful of either supplies 15 meq. of potassium and the daily dose is in the 40-80 meq. range.

Mercurial diuretics are not absolutely contraindicated as they formerly were thought to be. In fact, both Tenney and Reid recommend them. We have not had sufficient experience to warrant any comment.

When any patient is sick enough with toxemia to be hospitalized it is good common sense to place the patient on a high protein diet with 200 mg. or less of sodium per day. The matter of total fluid intake is of less importance, but the fluid intake should probably be maintained somewhere in the neighborhood of 2,000 cc. per 24 hours.

The importance of keeping an intake-output chart on the acutely ill patient cannot be emphasized enough, as diuresis frequently is one of the early and very important signs of amelioration. Unless the situation is a very desperate one, indwelling catheters should be avoided. However, in certain instances of very severe oliguria, the information to be obtained from an indwelling catheter may well outweigh the disadvantages.

Persistent albuminuria (3+ to 4+) over any period of time constitutes a very severe drain on protein reserves and should not be allowed to continue. Plasma albumin fractions are of little or no value. Termination of pregnancy seems to be the only recourse.

The treatment of the anuric phase is essentially the same as for any anuria, regardless of etiology. Anesthesia is a common precipitating factor. This is further discussed in the section on Anesthesia.

The artificial kidney may have a small but definite role in therapy of the anuric phase of toxemia. We have not had such a candidate at the Grace-New Haven Hospital in the past four years.

Antihypertensive Or Vasodilator Therapy

It is the opinion of many that if the patient is sick enough to warrant the use of any of these drugs she is sick enough to be hospitalized. After establishing a satisfactory maintenance dose in carefully selected instances, discharge from the hospital under very close observation may be safe and practical. Again it should be emphasized that lowering the blood pressure, per se, does not alter the course of the disease and may only succeed in lulling the patient as well as the physician into a sense of false security. Many consider that the hypertension is an adaptive mechanism to compensate for cerebral and/or placental arteriolar spasm and any marked reduction in blood pressure is therefore contraindicated.

If the blood pressure is very high and convulsions seem immiment, 1 mg. of aqueous Unitensin diluted to 20 cc. in 5 per cent dextrose in water may be given very slowly by vein. The blood pressure in the other arm should be watched continuously during this injection, as profound hypotension can occur. This is to be scrupulously avoided, as hypotension may lead to cerebral or renal anoxia with resultant damage even greater than that caused by the hypertension, per se. If there is sufficient time it is far better to use a slow intravenous drip consisting of 20 mg. of Apresoline and 5 mg. of Unitension diluted in 1,000 cc. of 5 per cent glucose in water. Blood pressure and pulse rate should be checked every five minutes for the first hour of administration and thereafter every 15 minutes as long as the drip is continued. The rate of flow of this vasodilator solution should be regulated to maintain the blood pressure above 140/90, or even higher if the original systolic blood pressure was well over 200. The antidote to Apresoline headaches (hydralazine) which occur in 10 per cent of the instances, is norepinephrine.

Hydralazine (Apresoline) increases uterine, renal and cerebral blood flow by increasing cardiac output and lowering peripheral resistance. As it lowers blood pressure it also lowers urinary output.

Rapid digitalization should be carried out at the very first sign of the appearance of pulmonary edema, which is often heralded by orthopnea and a non-productive cough, even before rales can be heard.

Reserpine probably acts directly on the hypothalmus to produce most of its effects. Thus, hypotension is a secondary effect. It also produces bradycardia as well as sedation. One of its advantages is that it does not produce headache as Apresoline not infrequently does. Nasal congestion in the infant can be a problem. However, using 5 mg. of Reserpine intramuscularly, its maximum effect occurs in about two hours and 20 minutes; whereas, the maximum effect of Apresoline is within one hour. Reserpine may be repeated every 6-8 hours. It takes many hours for a single dose to become effective. Once a level is built up, however, it apparently is a satisfactory drug. On occasion we do use oral Reserpine 2.5 mg. q. 8-12 hours or oral Apresoline 10 to 20 mg. three times daily on an ambulatory patient.

While the author has had no experience with the use of Veratrum derivatives, the following regime has been recommended by Reid: An average dose between 0.5 to 1.5 mg. of oral Protoveratrine is given three to four times daily. This dosage may be increased by 1-2/10 mg. per dose, depending on the urgency. However, the maximum single dose should be no more than 0.5 mg. If nausea and vomiting intervene it is not an indication to stop the therapy, but is a definite indication to regulate the dosage more carefully and almost universally means that the patient is receiving more Protoveratrine than she either needs or can tolerate. When the severity of the situation dictates the necessity, i.e., blood pressure of 200/120 or more, intravenous Protoveratrine can be utilized. While watching the blood pressure continuously, 0.12 mg. of Protoveratrine may be given, administered intravenously slowly. This may be repeated in 15 to 20 minutes but it is usually safer to follow the initial dose with a drip containing 0.05 to 0.1 mg. in 5 per cent dextrose in water.

Anticonvulsive Therapy

Antihypertensive agents are not anticonvulsive agents and should not be used at all in instances of hyperreflexia in association with normal or slightly elevated blood pressures.

The author is aware that the use of intravenous pentathol by drip method has a certain vogue by some obstetricians in this state. Krishna Menon, of Madras College, India, treated 75 cases of eclampsia in 1952 with this method and had a maternal mortality of 16 per cent. This was no lower than with other modalities of therapy and he thinks that the drug has application only in controlling the initial convulsion, but should not be used beyond that time. The author has had no experience in the use of intravenous pentathol. It is well to bear in mind that magnesium is probably the safest of all anticonvulsive drugs that have been employed in toxemia.

It should go without saying that there are other causes of convulsions in a pregnant patient. If a patient who is convulsing is being seen de novo one has to consider the possibility of idiopathic epilepsy, diabetic coma, cerebral vascular accident, uremia, brain tumor, trauma or poison. As a rule the differential diagnosis is not difficult.

When one is dealing with frank eclampsia 4 gm. of 20 per cent solution of magnesium sulfate can be given intravenously in a matter of four to five minutes. Care should be taken to be sure that the needle is in the vein, as this substance is very toxic if it is injected in any concentration outside the vein and readily produces a slough. In less dire situations, or in combination with the above, 5 mg. of a 50 per cent solution can be given intramuscularly in each buttocks and be repeated every four hours in the presence of a patella reflex, as long as the urinary output is 100 cc. or more during the preceding four hours. The magnesium sulfate should be continued throughout labor and delivery and for a minimum of 48 hours postpartum. Doses of magnesium usually refer to $MgSO_4 \cdot 7H_2O$. The amount of magnesium in the anhydrous salt is double that in the hydrated form.

There is a very considerable safety factor in the use of magnesium as long as one is sure of the urinary output. The normal blood level of magnesium is between 1.8 and 2 meq. The therapeutic level is in the range of 6 to 8 meq: The patella reflexes disappear at 7 to 10 meq., and it is not until 11 to 12 meq. are reached that respirations drop to the range of 12 per minute or less. The severe toxic level is 14 meq. or more. Intravenous calcium gluconate is the specific antidote. There are no antidotes for most other anticonvulsants. Magnesium apparently does not have a deleterious effect on the fetus.

Sedation

The role of sedation in the treatment of severe pre-eclampsia or eclampsia is certainly a very controversial one. The time-honored Stroganoff method is used in only a very few places today in this country. The work of McCall points out that morphine sulfate has a specific effect on the reduction in cerebral blood flow and a decrease in cerebral oxygen metabolism. There is no particular reason for believing demerol and other narcotics completely avoid the difficulties of morphine.

Practically every new sedative on the market, including most of the tranquilizers, I am sure, have been evaluated by various observers. Certainly the role of tranquilizers in the treatment of severe pre-eclampsia and eclampsia has yet to be clarified. Until such time as this may come to pass we choose to continue to rely largely on the use of sodium amytal. We do not use this primarily as an anticonvulsant, but, without doubt, by its use we cut down on the amount of magnesium necessary. The primary reason for its use is for a general sedative effect. The frequency with which the dose is repeated depends on the current situation. On the average, every four hours seems to be sufficient. If delivery is to be expected soon one should be aware of the depressant effect on neonatal respiration. Depending upon the situation, 250 mg. or more can be given intramuscularly or slowly intravenously. In less severe circumstances sodium amytal may be alternated every four hours with the magnesium sulfate. However, we prefer to use the magnesium sulfate primarily for hyperreflexia, and sodium amytal more as a general sedative. Phenobarbital 0.1 gm. intramuscularly, or 0.6 gm. orally three times daily is very frequently used for baseline sedation.

General Measures

When the patient is either very severely pre-eclamptic, about to convulse or convulsing, obviously the patient should be in a quiet, dark room with an attendant always present. A blood pressure cuff should be left on the arm at all times in order not to disturb the patient at each application and the blood pressure should be taken at least every 15 to 20 minutes—more frequently if necessary. Sideboards should be kept in the room. As soon as it becomes apparent that seizures are likely to supervene, sideboards should be used. One, or preferably two mouth gags should be made readily available at the bedside. Nasal oxygen should be at hand and used at the sign of any cyanosis or evidence of pulmonary edema. Nasal suction is, at times, life-saving, as these patients, during convulsions, may put out very copious amounts of frothy sputum, and if this is not suctioned out the patient may well "drown in her own secretions." Collins, of New Orleans, considers that a tracheotomy set should be in the room whenever deep cyanosis or any evidence of laryngospasm is present or likely to occur. In rare instances tracheotomy may have to be resorted to. A tracheotomy has never been necessary in my experience but in one patient it was very seriously considered. The matter of an indwelling catheter depends upon the severity of the situation and will be discussed elsewhere in the presentation. During the critical phase *no visitors* is an absolute must.

Termination Of Pregnancy

It seems trite to say that the only cure for toxemia is delivery. Nevertheless, convulsions may occur during the first few days postpartum. Though eclampsia may improve upon death of the fetus, this is not true uniformly, as we recently had a maternal mortality in a patient in whom it was known that the fetus died some 24 hours prior to the maternal death.

All other things being equal, the patient's general condition should be brought under control and her vital functions improved before delivery should be considered. In dealing with severe pre-eclampsia, if the fetus is viable, the cervix long and thick, and the general condition of the patient still precarious after a more or less arbitrary period of 24 to 48 hours of vigorous medical management, cesarean section should be seriously evaluated. However, it should be emphasized that many of these patients react quite satisfactorily to the administration of slow drip intravenous oxytocic substances and artificial amniotomy when obstetrically safe. If, however, after an attempt of some 12 to 18 hours, labor is not initiated, or satisfactory progress is not being made, again cesarean section should be seriously entertained. In those patients in whom the condition deteriorates despite therapy, one must make a quick decision and sometimes be sorry. There is no reason why intravenous Apresoline and Unitensin cannot be continued during the operative procedure.

From July 1, 1953 to June 30, 1960 there were 510 primary cesarean sections done in the Grace-New Haven Community Hospital. The primary indication was severe pre-eclampsia or eclampsia in eight (1.6 per cent) of these. These data, far better than words alone, point out that we consider vaginal delivery as the method of choice in most instances.

Anesthesia

The choice of anesthesia here is of the essence, and the choice is frought with danger, as these people tolerate both general anesthesia and spinal anesthesia very poorly. There is no doubt but that in experienced hands local anesthesia is by far the safest method. However, very few obstetricians are adept at this technique. It is incredible the facility with which one, experienced with local anesthesia, can proceed. Nevertheless, this technique should be used sporadically by one not well versed in its use.

As regards general anesthesia, it has been well established that there is constriction of the afferent and efferent vessels of the kidney and increased secretion of anti-diuretic hormone, as well as alteration in aldosterone secretion in such a manner that there is less sodium chloride excretion. These factors are probably not as important as they may seem to be, as the blood urea nitrogen is usually not elevated. The toxemic kidney, however, tolerates anoxia very poorly regardless of its etiology.

The story for conduction anesthesia, on the surface, seems better. There is a lowering of the hypertension in association with conduction anesthesia and an increase in kidney circulation and much less disturbance with the anti-diuretic hormone secretion and aldosterone mechanism. The choice of anesthetic at Grace-New Haven Community Hospital for the eight severe pre-eclamptics or eclamptics who were sectioned in the last five years, shows that three received general anesthesia and five regional anesthesia. Four of the eight infants died, so there seems no obvious predelection from this point of view. Our anesthetists favor conduction anesthesia, but hasten to point out that one should be very careful to avoid hypotension and be prepared to deal with it immediately should such ensue.

Probably the biggest obstacle in the use of conduction anesthesia is hypotension and the biggest hazard in the use of general anesthesia is keeping the patient too deep, allowing for further anoxia to the kidney, with subsequent partial or total renal shut-down. In no instance should the anesthesia be given by other than the best anesthetist available, as the matter of anesthesia can be and very frequently is critical. It is almost mandatory that no general or conduction anesthesia be administered for a matter of eight to ten hours after a general convulsive seizure of eclamptic etiology. For reasons that are not understood these patients frequently develop marked hypotensive states and subsequent anuria.

Post-Delivery Management

The management of the toxemia does not cease upon delivery. The danger of convulsions exists for a minimum of 48 hours and possibly longer. There are reports in the literature in the last few years that lead one to believe that the threat of convulsions may last as long as a week to ten days post-delivery.

The use of oxytocic substances, particularly ergotrate and methergine, should be avoided, as they both have vasopressor effects. If an oxytocic is absolutely necessary, probably drip syntocinin is the safest drug available.

Discussion

Nothing new is presented. However, an attempt has been made to put therapy on as rational a basis as is possible today. There is no question but that other approaches are just as satisfactory as the one outlined here. If a generalization is justified, it might be that as a rule, mild pre-eclampsia is routinely over-treated and severe pre-eclampsia is frequently under-treated. Almost without exception the handwriting is on the wall long before severe pre-eclampsia or eclampsia supervenes. If active treatment is instituted early enough severe pre-eclampsia can be almost uniformly avoided, or very successfully ameliorated. Once it occurs there seems little doubt but that a combination of attacks on the major factors, i.e., hypertension, hyperreflexia and urinary output are of utmost importance. It seems more rational to treat each of these individually and not rely on any one drug.

Unfortunately there is no drug today which is ideal for prolonged use in hypertension or hyperreflexia in the treatment of severe pre-eclampsia. All other things being equal, when this situation intervenes it is the better part of good judgement to get the patient in the best possible shape and get her delivered. The problem of prematurity is a very real one and individualization of the handling of cases is manditory.

There is more or less general agreement today that there is a close correlation between the duration (rather than the severity) of severe pre-eclampsia and subsequent chronic hypertension.

Summary

A resume of our therapy in severe toxemia has been presented. We believe in a multifaceted attack which allows for using individual therapy for specific signs and symptoms.

a) Low sodium, low caloric diet and chlorothiazide for edema.
b) Apresoline and Unitensin for hypertension.
c) Magnesium sulfate for its anti-convulsant properties.
d) Sodium amytal and phenobarbital for general sedation.

References

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Hemodialysis In The Community Hospital[1]

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■ The Norwalk Hospital Renal Unit was the first hemodialysis team established in Connecticut, treating its first patient on April 1, 1958. Since that time we have found that this valuable, often life-saving, procedure can be carried out in a community hospital with relative ease if an effective organization and modus operandi are established. We hope that a summary of our experiences will encourage other institutions to set up their own units, or to make more frequent use of those in nearby communities.

The Renal Unit

The original Renal Unit at the Norwalk Hospital included two internists and two surgeons, the latter, both experienced in vascular surgery, and one of whom was also a genito-urinary surgeon. More recently, other well qualified men have joined the Unit to offset the great demands made on the time of the participants. All physician members of the Renal Unit are private practitioners. Since each dialysis takes from six to twelve hours, a work schedule for members of the Renal Unit is prepared ahead of time. Once the procedure is underway a single physician in attendance has been found to be sufficient.

The Renal Unit also includes a surgical technician who is thoroughly familiar with the equipment used for dialysis and is responsible for maintaining the artificial kidney, obtaining chemicals and drugs from the pharmacy, stocking the equipment cart, and replenishing other disposable supplies. He prepares the room, has all the equipment in running order and is present or available at all times during the course of a dialysis.

A nurse is always present, constantly monitoring the patient's vital signs. She is specifically instructed in the complications peculiar to this procedure. The nursing office has assumed the responsibilty of providing a nurse at any time.

Clinical laboratory service is continuously available for prompt analyses and reports.

Dialysis

From the several types of dialysis equipment available, we have selected the Kolff Twin Coil Disposable Kidney (Travenol) for our use since it offers certain advantages over other units. It is a well designed and compact unit which can easily be moved from area to area in the hospital. Its greatest single advantage is the dialyzing coil and tubing which are disposable. We have found this kidney to be sturdy and dependable, and we receive rapid service from the manufacturer for spare parts and disposable equipment.

In use the radial artery of the patient is cannulated. The blood flows out through plastic tubing connected to the cannula. This tubing rests in a sigmamotor pump which propels the blood forward into the double cellophane dialyzing coil. After several circuits the blood passes from the coil through another plastic tube, reentering the body by way of a cannulated antecubital or brachial vein.

The dialyzing coil is immersed in a one-hundred liter tank containing tap water (39°C) to which has been added sodium chloride, sodium bicarbonate, potassium chloride, calcium chloride, and magnesium chloride, calculated to be equimolar in concentration to the levels in normal plasma. If the patient is known to have elevated serum potassium or magnesium levels, the amounts of these elements added to the bath fluid are reduced. One liter of 40 per cent invert sugar is also added to the tank as is lactic acid to adjust the pH. A mixture of oxygen (90 per cent) and carbon dioxide (10 per cent) is bubbled through the bath fluid continuously.

The tubing and coil are rinsed with sterile saline and then filled with banked blood to which

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is added heparin. Heparin must be used since it is non-dialyzable, whereas citrate is dialyzable. Four to six units of blood are crossmatched for each dialysis. This amount is needed to prime the coils (two units), to cover accidental losses and to be on hand, if needed, for transfusions. Blood banked up to three weeks may be used unless the patient has marked hyperkalemia with associated electrocardiographic changes. In this case fresh blood must be used to avoid additional potassium poisoning.

Most cannulations are performed on an emergency basis in the operating room with local anesthesia, under strict rules of asepsis. For single dialyses in acute conditions metal cannulae are used. These are removed at the end of the treatment. When they are removed, the artery is repaired surgically and the vein ligated. For long-term dialysis, specially designed teflon cannulae are implanted in the forearm.[6] When not in use they are connected externally producing an arterio-venous shunt.

During dialysis the bath temperature is automatically maintained at 39°C, a pump works continuously maintaining a flow of bath fluid over the coils, and the sigmamotor pump is adjusted to maintain a flow rate of blood between 200 and 400 milliliters per minute. In most cases the bath fluid is changed every two to three hours to maintain the greatest rate of dialysis. In cases in which it is desirable to remove excess body fluids, the hydrostatic fluid pressure within the coil may be increased by applying a constricting clamp to the tubing distal to the coil. The clamp is set to give a reading of 250 to 280 millimeters of mercury on an aneroid gauge attached to one of the filter chambers. This will effect the ultrafiltration of about one liter of water per hour from the body.

Additional observations on the use of the Kolff Twin Coil Disposable Kidney are clearly detailed in the manufacturer's booklet.[7]

The dialyses are carried out in a room equipped with a sink, hot and cold water, special lighting, a telephone, and additional space for equipment and drug carts, surgical trays, oxygen, electrocardiograph equipment and a cardioscope.

Just before dialysis the patient is given five thousand to seven thousand units of heparin intravenously. Every hour the Lee-White Clotting Time, and a hematocrit are determined. Additional heparin is given, if needed, to maintain the clotting time between twenty and thirty-five minutes. The patient's blood pressure, pulse, and respirations are checked frequently, as often as every ten minutes, since rapid changes may take place in blood volume and cardiac output. Frequently additional blood must be added to the system and occasionally hypotensive drugs must be administered. As a rule, electrolyte determinations and other laboratory determinations to assess renal function and to measure poison levels are done only prior to, and at the completion of dialysis. Occasionally it is useful to follow a patient's course during dialysis chemically, particularly in cases of barbiturate and salicylate poisoning.

A large variety of drugs is kept on hand to meet any one of the complications which may develop. The most common of these complications are shock, hypertensive crises, dangerous arrhythmias, acute agitation and convulsions from hypocalcemia. Many drugs are not very effective since they are rapidly removed from the body during dialysis. We have found that promethazine hydrochloride, by intramuscular injection (25-50 mgm), is one of the most effective sedatives under these conditions.

Although the apparatus is simple in design, many mechanical problems may develop in the course of a six to twelve hour dialysis. We have had instances where connections on the tubing have come apart, where a coil has broken, where the arterial or venous cannulae have become obstructed with clots, where the hospital power has failed, where the circulating pump has burned out, where blood has clotted and obstructed the filter chambers, and innumerable other minor mishaps. We have learned that when using ultrafiltration it is imperative that all joints of the polyethylene tubing be firmly taped together, lest they separate. It is obvious that a dialysis treatment must be under continuous monitoring by trained physicians and other personnel. It is also imperative to have spare tubing, coils, parts and chemicals available to meet any of these and other potentially hazardous situations.

Policies

Our Renal Unit is always on call as most of the situations in which dialysis is used are acute emergencies. Most consultations have involved patients from the fifteen mile radius around the hosptial, which covers a population of about 120,000 persons. The consultations originate with physicians of the Norwalk Hospital staff. The attending physician calls a physician member of the Renal Unit who accepts the patient for treatment if it appears warranted, or arranges for alternative treatment or further consultation if the indications for dialysis are not clear. In some instances all physician members of the Renal Unit are involved in a collective decision. An additional source of patients is the Poison Control Center, whose staff is informed of all poisonings; it notifies the Renal Unit immediately when there is any possibility of treatment by hemodialysis. Other patients are referred from neighboring hospitals; if telephoned information is inadequate we send a consulting team to examine the patient.

Costs

The specific hospital charge for a single dialysis is $175.00 and includes private nursing care for six to twelve hours, an operating room charge for implantation of cannulae, the disposable Kolff Twin Coil Kidney (Travenol), blood bank charges, and overhead write-off. This charge is passed on to the patient and has been accepted by most hospital insurance plans. There are, of course, the usual hospital charges for room and board if the patient remains for more than twenty-four hours. Inasmuch as long term dialysis for the treatment of chronic renal failure is performed at least weekly, it is modestly estimated that one year of treatment costs $10,000, to which must be added other hospital and nursing charges. This is the greatest single handicap in making this service more generally available.

The Renal Unit physicians have not personally collected any professional fees for hemodialysis. When professional fees were charged in an amount depending on ability to pay, the money was directed into a special fund dedicated to research and development of physiologic units at the Norwalk Hospital.

Indications For Dialysis

Hemodialysis is a method of acquiring time to permit injured kidneys to heal and spontaneously regain function or to leach a body of poison. Indications for dialysis in renal failure rest upon life threatening signs and symptoms.[1] These may include intractable cardiac failure in uremia, hyperkalemia, severe acidosis unresponsive to medical management, and evidence of cerebral depression or irritability. In the case of poisons, indications for dialysis are ominous clinical signs or blood level of the dialyzable poison.

Table I represents a summary of conditions in which hemo-dialysis may be indicated.

Occasionally cases of acute glomerulonephritis assume a malignant course causing death during the first attack. Hemodialysis in these cases may not only be life saving but may give time for the diseased kidneys to spontaneuosly regain normal function.

TABLE I

ACUTE CLINICAL CONDITIONS IN WHICH UREMIA MAY PREDOMINATE AND IN WHICH HEMODIALYSIS MAY BE INDICATED

A. Acute glomerulonephritis

B. Lower nephron nephrosis (Due to such causes as protracted shock, incompatible transfusions, burns, crush injuries, sepsis and poisons)

C. Acut renal failure where diagnosis is not established

D. Acute renal failure superimposed on chronic kidney disease (Such as acute pyelonephritis, lower nephron nephrosis)

E. General poisons

Protracted shock may lead to lower nephron nephrosis with oliguria or anuria. This most commonly occurs post-operatively but may be seen following poisoning, trauma and a variety of other conditions. In some injuries, such as severe burns, electrocution with muscle coagulation, and "crush" injuries, the release of tremendous amounts of potassium from the damaged tissues in the presence of lower nephron nephrosis creates an immediate threat to life from hyperkalemia. This is an absolute indication for prolonged hemodialysis, repeated if necessary.

Certain poisons may cause severe but reversible tubular necrosis. This is particularly true of the heavy metals (mercury, gold, etc.), carbon tetrachloride, and ethylene glycol.

Occasionally a case of uremia is seen in which there is little time to establish an accurate diagnosis. In this situation dialysis may be indicated to gain time for further evaluation of the patient.

With borderline renal compensation, a patient with chronic nephrits may develop a superimposed condition which leads to acute renal failure. Occasionally an acute pyelonephritis superimposed on polycystic kidney disease or chronic nephritis may cause, a serious predicament wherein only dialysis is beneficial.

When anasarca is the major problem. elimination of excess water can be readily produced by increasing the pressure in the coil as already outlined. This is particularly useful in intractable cardiac failure. It may also be used to permit packed red cell, or whole blood transfusion through creation of temporary hypovolemia.

Hemodialysis may be used effectively to eliminate poisons in acute poisoning by the barbiturates salicylates, ethyl and methyl alcohol, acetophenetidin, bromides, glutethimide, thiocyanates and others. The poison must be of low enough molecular weight to be dialyzable and not firmly bound to body proteins.

Long term repeated dialysis for prolongation of life in selected patients with chronic renal failure can now be achieved practically.[3,4,5] Decisions concerning this however, are extremely difficult to make. Since the cost of this treatment is well beyond the means of the average patient, and only a small proportion of potential candidates can be treated by any one institution in a given year, arbitrary criteria must be established for selecting patients for long term dialysis. This subject has been reviewed by Hegstrom, et al.[4]

Results

In over five years the Renal Unit of the Norwalk Hospital has treated twenty-nine patients with a total of fifty-nine hemodialyses. There have been six cases of acute uremia, nine acute poisonings and fourteen cases of chronic uremia. The data are summarized in Tables II and III.

In addition to the above, approximately 50 cases have been seen in consultation for whom dialysis was not recommended. In the cases of acute uremia or poisonings, not dialyzed, the Renal Unit recommended continued medical management as the treatment of choice. It is well recognized that spontaneous recovery may occur in most forms of acute anuria, as well as following sublethal doses of poisons. It is not possible to enumerate all the criteria used in recommending dialysis, since the ultimate decision is based on experienced clinical judgment. If dialysis seems indicated, and there is reasonable doubt as to survival of the patient without dialysis, this consideration alone is often the deciding factor. Only 5 cases of chronic renal failure were seen in consultation who were not dialyzed. These were patients in whom long term dialysis could not be justified because of the presence of other complications (severe heart failure, cirrhosis, hemorrhagic tendencies, etc.). We are now being faced with the problem of introducing new criteria for selecting patients with chronic renal failure. As greater demands are made on the services of the Renal Unit, patients with chronic renal failure will have to be individually selected. The number dialyzed will depend strictly on the ability of the Renal Unit to devote time to their care and on the economic feasibility of the hospital in sustaining this program.

Table II

Summary of Cases of Acute Renal Failure and Poisoning Dialyzed at The Norwalk Hospital.

	AGES	NO. CASES	NO. DIALYSES	NO. SURV.
Acute glomerulonephritis	28	1	1	1
Lower nephron nephrosis:				
Sulfonamide	48	1	1	1
Carbon tetrachloride	42	1	1	1
Trauma; ruptured kidney	35	1	2	0
Post-operative	66	1	1	0
Electrocution, hyperkalemia	23	1	2	0
General Poisons:				
Acetylsalicylate	1½,16,37	3	3	3
Barbiturate	17,26,38,68	4	4	3
Glutethimide	35	1	1	1
Ethyl alcohol	41	1	1	1
		—	—	—
Total		15	17	11

Acute Uremia—Of the six cases of acute uremia, one patient had acute glomerulonephritis and the others, lower nephron nephrosis. All were managed medically until such time as survival without dialysis appeared doubtful. The patients with acute glomerulonephritis, and lower nephron nephrosis due to carbon tetrachloride and sulfonamide were each dialyzed once and subsequently regained normal renal function. All are now free of demonstrable renal disease. One patient developed lower nephron nephrosis following multiple body injuries (ruptured spleen, fractured pelvis, ruptured kidney) and died of other complications despite two hemodialyses. An older man (66) who developed postoperative anuria, died shortly after dialysis of an overwhelming pneumonia. One 23 year old man who was electrocuted, had extensive burns, and severe electrocoagulation of his entire right thigh, developed anuria and severe hyperkalemia. Despite two hemodialyses in 4 days, and the administration of large quantities of a potassium adsorbing cationic exchange resin, it was impossible to control the lethal quantities of potassium being liberated from the area of muscle injury or to reverse the hyperkalemic electrocardiographic changes. He died suddenly of cardiac arrest, just prior to a third hemodialysis.

Acute Poisonings—Nine patients were treated for general poisoning. At the time of hemodialysis,

Table III

Summary of Cases of Chronic Renal Failure Dialyzed at the Norwalk Hospital

CONDITION	AGES	NO. CASES	NO. DIALYSES	NO. SURVIVING	NO. DAYS SURVIVAL AFTER FIRST DIALYSIS
Malignant nephrosclerosis	44,43,48	3	3	0	0,11,18
Chronic glomerulonephritis	43,17,66,50,52,59	6	14	0	7,11,14,35,57,90*
Polycystic kidney disease	62,35	2	8	0	15,64*
Chronic pyelonephritis	48	1	14	0	242*
Kimmelstiel-Wilson's Disease	41	1	2	1	Remission
Chronic gouty nephritis	43	1	1	1	Active case
		—	—	—	
Total		14	42	2	

* Implanted with permanent Teflon cannulae.

seven had areflexia and were in deep coma and two (salicylate intoxication) were semicomatose. Most required vasopressor drugs for the treatment of shock prior to and during dialysis.

Selection of three salicylate poison cases for dialysis was based on four absolute indications, evidence of cerebral toxicity, coma, severe metabolic acidosis, and blood salicylate levels in excess of 60 mg per cent. All these cases became toxic approximately 24 hours after the ingestion of the drug. Each gave dramatic evidence of the benefit of dialysis during the course of this treatment, regaining consciousness, becoming oriented and losing their hyperpnea. Dialysis was continued until the salicylate blood levels dropped below 20 mg per cent. All three cases showed signs of lower nephron nephrosis within 24 hours following dialysis probably due to their varying degree of shock. The baby (age 1½) showed transient albuminuria, but no azotemia. The others developed albuminuria, oliguria, and marked azotemia for several days. They ultimately developed a spontaneous diuresis and regained normal renal function without the need for additional hemodialysis.

The four cases of barbiturate poisoning had blood levels in excess of 3 mg per cent. One patient (68 year old male) developed cardiac arrest and apnea prior to dialysis. He was revived with external cardiac massage and sustained with a tracheostomy and a respirator for the duration of the hemodialysis. A 17 year old boy also required a respirator and tracheostomy. One patient (38 year old woman) in this group died of irreversible cerebral damage.

One case of glutethimide poisoning responded dramatically to hemodialysis but died several days later from late toxic effects of glutethimide (thrombocytopenia, and hepatic failure). The one case of ethyl alcohol poisoning also developed cardiac arrest prior to dialysis but responded to external cardiac massage and survived without complications.

Chronic Uremia—Fourteen patients were treated for various diseases resulting in chronic renal failure. All had reached a terminal phase of their illness at the time of the first dialysis as evidenced by severe acidosis, oliguria, azotemia, cerebral symptoms and in some instances anasarca and uremic pericarditis. All were treated for prolongation of life. In this group of cases the criteria for hemodialysis differ from the acute case, in that the aim is to maintain the patient as symptom-free as possible and to eliminate the dangers of the uremic state (hyperkalemia, acidosis, cerebral symptoms, etc.).

Prior to the development of the permanent Teflon and Sialastic cannulae, long term hemodialysis treatment was performed by either individual repeated cannulations with metal cannulae or by leaving these cannulae in the blood vessels and guarding against local infection and vascular thromboses. The limitations of this approach are clearly the continuing availability of accessible blood vessels. Nevertheless, with this technique eleven cases were successfully treated for periods of time up to 57 days. (See Table 3). These included three cases of malignant nephrosclerosis, five cases of chronic glomerulonephritis, one case of polycystic kidney disease, one case of gouty nephritis, and one case of Kimmelstiel-Wilson Disease. One patient was discontinued from further treatment at the request of the family, acknowledging the hopelessness of the situation. Six patients died of cardiovascular complications and two from infections. The most significant complication was the development of an acute bacterial endocarditis arising from an infected cannula in one patient with polycystic kidney disease, sharply focusing on the hazards of intermittent cannulations. The patient with gouty nephritis has only recently had one dialysis and it is too early to assess the need for continuing treatments. The case of Kimmelstiel-Wilson's Disease was terminal at the time of his first dialysis, but remarkably, after two hemodialyses is now in a state of remission on medical management, and has returned to work.

With the advent of permanently implanted Teflon cannulae[6] and more recently the use of Sialastic connectors it has become feasible to render long term dialysis for indefinite periods of time. They have reduced the hazards of infections and intravascular clotting but most important, permit the continued use of the same artery and vein.

The first case treated was a 35 year old man with polycystic kidney disease. He was sustained for 64 days with the assistance of seven hemodialyses, finally succumbing to a virulent pyelonephritis.

A 48 year old woman with chronic pyelonephritis was kept alive for 242 days. At the onset she had severe uremic pericarditis which cleared completely under treatment. She was well enough during most of this time to drive herself to the hospital for her treatments, and generally enjoy freedom from the symptoms of her disease. She died during an attack of ventricular fibrillation after her fourteenth hemodialysis.

We have recently treated a 59 year old man with chronic glomerulonephritis. He was originally sustained with peritoneal dialysis but was finally implanted with a permanent shunt. This was done at the Peter Bent Brigham Hospital where he had several hemodialyses. After his transfer to the Norwalk Hospital he had six additional dialyses. He finally died of intractable cardiac failure 90 days after his initial dialysis.

Summary

The experience with extracorporeal hemodialysis at the Norwalk Hospital has been reviewed and the practical and administrative aspects of organizing a renal unit are discussed. A brief review is presented of our experience to date which includes six cases of acute uremia, nine cases of poisonings and fourteen cases of chronic renal disease, three of whom received long term repeated dialyses.

The satisfaction we have obtained in successfully treating patients who appeared doomed without hemodialyses has been most rewarding.

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> The first subject of experiment was an aged female, on whom all the usual remedies had been fully tried, without producing one good symptom; the disease, continued uninterrupted, holding steadily on its course. She had apparently reached the last moments of her earthly existence, and now nothing could injure her—indeed, so entirely was she reduced, that I feared I should be unable to get my apparatus ready ere she expired. Having inserted a silver tube into the basilic vein, cautiously, anxiously, I watched the effects, as ounce after ounce of salt solution was injected, but no visible change was produced. Still persevering, I thought she began to breathe less laboriously, soon the sharpened features, and sunken eye, and fallen jaw, pale and cold, bearing the manifest impress of death's signet, began to glow with returning animation, the pulse, which had long ceased, returned to the wrist; at first small and quick, by degrees it became more and more distinct, fuller, slower, and firmer, and in the short space of half an hour, when six pints had been injected, she expressed in a firm voice that she was free from all uneasiness, . . .
>
> —T. Lata, Treatment for Cholera by Infusion of Salt Solution, *Lancet* 11, 274: 1832.

Physiatric Management Of Disabilities Due To Neurologic Disease

**By Thomas F. Hines, M.D., Frederick E. Dugdale, M.D.,
Herman L. Kamenetz, M.D., and Lee B. Greene, M.D.**

Part II

IV. Gait Abnormalities

■ Human locomotion consists of an intricate series of angular motions of the hips, knees, and ankles plus compensatory motion of the trunk and upper extremities. These combine to move the body's center of gravity in a rhythmic succession of lateral and vertical oscillations.

Human gait is divided into three main phases: stance, swing, and double support. Interference of any kind with any of the participating factors or forces will result in abnormalities of gait. Many of these will show characteristics which quickly reveal themselves to the trained observer.

Examination of the patient for gait abnormalities includes walking with and without shoes and clothes so that the hips, legs, and trunk may be fully observed. Observation should be from the front, back, and side with individual attention given to the foot, ankle, knee, hips, and upward to the head. Each joint should be observed in each of the phases and combined so that the over-all gait pattern may be appreciated. If the patient is using support, observation should be made with and without such support.

In gait analysis some of the factors which should be considered are muscle weakness, decreased range of motion, incoordination, involuntary motions and spasticity, which have been discussed above.

(1) MUSCLE WEAKNESS

A well known aberration of gait is the so-called Trendelenburg gait which is due to weakness of the hip abductors, and consists of a drop of the pelvis on the uninvolved side during the stance phase of the involved side. In some cases of pronounced weakness there is, in addition, a compensatory lateral trunk bend to the involved side, an attempt to balance the body weight over the involved weight bearing hip. Another common example of muscle weakness is the flaccid foot drop gait caused by weakness of the ankle dorsiflexors. With this gait the patient is forced to flex the hip and knee more than normal in order to clear the dropped forefoot.

The gait due to triceps surae weakness shows lack of push off on the involved side with shorter step length of the uninvolved side. The faster the patient walks, the more obvious the deficit.

(2) DIMINISHED RANGE OF MOTION

The tightened heel cord is revealed in gait by a more rapid heel rise and knee break when the involved side is at the end of the stance phase. The patient may externally rotate the foot to reduce the necessity of foot dorsiflexion.

With iliotibial band contracture the patient appears to have unequal leg length with the pelvis lower on the involved side.

Hip flexion contracture shows increasing lordosis at the end of the stance phase and at push off on the involved side. This is due to lack of complete hip extension and compensatory need for lumbar lordosis.

Lumbar spine immobility as in rheumatoid spondylitis shows the lack of compensatory pelvic motion in the end of stance and push off bilaterally. This shortens the step length and again is more evident with increasing speed of the gait.

(3) SPASTICITY

Spastic foot drop gait is evidenced by apparent lengthening of the limb caused by fixed plantar flexion of the foot and is usually accompanied by knee and hip spasticity causing the patient to circumduct the limb in the swing phase.

The scissors gait is caused by adductor spasticity

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and is evidenced by "scissoring" or crossing of the knees during ambulation.

(4) DYSTONIA

The dystonic gaits are generally broken staggering types of ambulation. The limbs move irregularly without normal rhythm and generally through an unpredictable pattern. Excessive motion of the upper limbs may be used as a balancing mechanism. Typical examples of such gaits would be the ataxia of multiple sclerosis, the "festinating" gait of Parkinson's Disease, and the severe athethosis of the cerebral palsied patient.

(5) SENSORY LOSS

The patient with sensory loss exhibits an unsteady, often broad based, irregular, gait pattern. A fairly typical example of this type gait is seen in the hemiplegic patient with complete loss of position sense (proprioception). The patient loses awareness of the position of his limb in space and may attempt to bear weight on it irrespective of its location. Any disease involving the posterior columns will produce the same general pattern and, when bilateral, presents a severe problem for retraining.

V. Impaired Respiration

Impaired respiration may result from involvement of:

(a) The respiratory center
(b) The muscles of deglutition
(c) The phrenic nerve (diaphragm)
(d) The thoracic and other respiratory muscles.

In quiet inspiration the diaphragm with the first and second intercostal muscles is active. One deeper inspiration the third to eleventh intercostal muscles are successively involved with increased excursion of the diaphragm.[7] The intercostal muscles primarily stabilize the intercostal spaces to maintain the negative intrapleural pressure. With still deeper inspiration the muscles about the thoracic inlet (scalenes, sternocleidomastoids) become active. These muscles by contraction against a stable cervical spine elevate the thoracic inlet and with the combined action of the intercostals elevate and rotate the ribs to increase the anteroposterior and transverse diameters of the thorax. In extremely deep or labored inspiration the shoulders may be fixed to allow the serratus anterior to act as an additional thoracic elevator. This is why anyone needing deep inspiration will fix the upper limbs to a table or a bed. Extension of the dorsal spine itself may somewhat elevate the thorax and depress the diaphragm by weight of the abdominal contents pulling on it.

Quiet expiration is a passive or rebound phenomenon in which tension on elastic tissue within the lungs is released with expulsion of air. With forced expiration, the intercostals, in reverse order, act to depress and derotate the ribs thus decreasing the anteroposterior and transverse diameters of the thorax and compressing the lungs.[9] Expiration can be passively enhanced by flexion of the neck and trunk, depressing the ribs, and increasing intra-abdominal pressure. Upon more forced expiration the abdominal muscles become active to depress the thorax and increase intra-abdominal pressure and elevate the diaphragm.

From these observations we see the importance of accurate examination of all the respiratory muscles. Involvement of the respiratory center will change the rate, rhythm, and depth of respirations. Complete loss of such control may be temporarily substituted for by the mechanical respirator or electrophrenic stimulation.[9] With partial involvements, irregular depth and/or rhythm, a respirator may be contraindicated as the patient may become excessively fatigued due to opposing at times the regular rhythm of the machine. Oxygen saturation studies by oxymetry will indicate the therapeutic requirement of gaseous support. With involvement of the muscles of deglutition the patient is prevented from clearing the oro- and naso-pharynges of pooled secretions by swallowing. The secretions may then be aspirated to produce mechanical obstruction to respiration or aspiration pneumonia. Tracheostomy is mandatory to reduce the dangers of such complications.

Paretic muscles must be recognized in order to protect them from overwork and fatigue. Soft diet, nasogastric tube, or intravenous feedings, adequate airway, and oxygen saturation are protective to weakened musculature.

Involvement of the phrenic nerve is sometimes seen in poliomyelitis, radiculoneuronitis, and amyotrophic lateral sclerosis. Treatment will depend upon the severity of the lesion, the status of the accessory muscles, and the prognosis. Unilateral paralysis of the phrenic nerve may not come to the attention of the examiner if the patient is at rest. With increasing activity the lack of respiratory reserve will be noted. It therefore becomes necessary in the diseases mentioned above to examine the respiratory system by clinical and special study so that minor involvement is not overlooked.

Acute lesions may need therapeutic rest while a chronically progressive lesion will need vigorous treatment to bring in and maintain accessory muscles of respiration. It should be realized that the accessory muscles can maintain approximately 50-60 per cent of the respiratory capacity, and by exercise and training may supplant a paralyzed diaphragm.

The accessory muscles include those about the posterior shoulder girdle—serratus anterior, rhomboids, scalenes, the sternocleidomastoids, and also the abdominals. The intercostals are considered by some as accessory muscles. In very severe degrees of respiratory paralysis the back extensors and even the platysma and muscles of deglutition must be considered as accessory muscles of respiration. Many muscles of deglutition, such as the tongue, supra and infrahyoids, are accessible to specific exercise and training. When only the muscles of deglutition remain, the patient may learn air swallowing or "frog (glosso-pharyngeal) breathing" for temporary respiratory maintenance. A considerable amount of lung inflation may be achieved by this means.

In similar fashion the abdominals alone may maintain respiration in the upright position. Contraction of the abdominal muscles increases intra-abdominal pressure to elevate the diaphragm. Abdominal muscle relaxation allows inspiration by permitting the abdominal contents to pull the diaphragm down. The so-called belt or abdominal respirator works exactly on this principle. This type of patient suffers respiratory embarrassment immediately upon assuming the supine or prone positions.

The following mechanical respiratory aids may be used at various times in the treatment of respiratory paralysis or respiratory embarrassment: (1) Tank respirator, (2) Positive pressure dome, (3) Cuirass, (4) Positive pressure breathing equipment, (5) Rocking bed, (6) Electrophrenic stimulator.

Physical treatment of respiratory weakness will consist of exercises to the muscles of respiration as with other voluntary muscles. While the timing of respiration is usually not under voluntary control, proper gradation may be achieved by the judicious use of a respiratory aid to prevent overwork coupled with exercise of proper intensity and frequency.

It must also be remembered that strengthening of various accessory muscles may improve the patient's respiratory exchange. In this manner a patient may become respirator free for several hours after the development of the maximal function of the platysma and with adequate strengthening of the dorsal extensor muscles.

In addition to muscle weakness, per se, the factors of spasticity and incoordination must be considered as individual muscles are examined. Breathing patterns may be changed in the cerebral palsied patient with spasticity or athetosis.

The principles of treatment of respiratory difficulties require (1) a free airway, (2) the use of respiratory aids with or without gaseous supplements, (3) maintenance of adequate fluid and nutritional intake, and (4) physical treatment of weakened muscles by appropriate measures.

VI. Impairment Of Special Functions

The problem of special function impairment is beyond the scope of this paper. Recognition of these problems is, however, important and the use of special facilities and equipment indicated.

A. Visual Problems—Briefly, varying visual problems such as hemianopsia and other quadrant defects may require little treatment. The patient may be trained to simply turn his head. For diplopia a simple eye patch used alternately over each eye may reduce some of the concomitant imbalance and vertigo. Complete blindness must be handled by special training facilities.

B. Speech Problems—There are many types of speech impairment which may result from lesions in different parts of the nervous system.

(1) Lesions in the brain may give rise to aphasia or dysarthria.

(2) Recurrent laryngeal nerve involvement can result in speech deficits.

Several types of aphasia determined by the parts involved must be distinguished before treatment is undertaken. Aphasia may be receptive, expressive, or mixed which is a combination of both expressive and receptive; there is also total or global aphasia.

Dysarthria may be central or peripheral in origin. Hypoglossal nerve involvement with paralysis of the tongue would give a wooden or blurred type of speech. Facial nerve paralysis, if sufficiently great, can cause one side of the mouth to droop and make speech somewhat indistinct. Trigeminal nerve involvement affects the muscles of mastication, and may prevent the mouth from opening or closing enough to make speech adequately distinguishable. A large group of clinical neurological illnesses has concomitant speech disabilities resulting from spasticity or rigidity in muscles of phonation and particularly are these seen in multiple sclerosis, cerebral palsy, and in some advance cases of Parkinsonism. Paresis or paralysis of the respiratory muscles will interfere with speech in that the length of phrases or sentences which the patient can utter will be reduced according to the degree of disability and the respiratory capacity. One may summarize the areas of disability as (a) those due to cerebral lesions and (b) those due directly to lesions of the phonatory apparatus. In general, it may be said that the central lesions usually show a poorer prognosis than those of the organs of phonation.

The management of these problems consists of speech therapy, strengthening of muscles, esophageal speech in laryngectomized patients, electronic speech devices, the use of sign language, the use of paper and pencil, and other methods of communication. The approach to improvement of speech will depend on whether the disability is in the cerebral centers of speech or in the peripheral muscles of phonation.

C. Hearing—Many illnesses may affect the eighth nerve. Tumors, similarly, may be destructive of the auditory nerve. If there is a complete loss of hearing by nerve involvement, lip reading becomes the treatment of choice. Partial losses may be compensated for by hearing aids.

D. The vestibular apparatus—In some individuals with vestibular dysfunction, weighted shoes, weighted canes, walkerettes, or similar walking devices may have value. Weighted utensils or unidirectional braces may be assistive. The objective of treatment in these cases is to broaden the base of ambulation or lower the center of gravity.

E. Skin and skin sensation—Skin sensation may be impaired by (1) destruction of the sensory nerve endings in the skin, (2) involvement of the sensory nerve itself, (3) lesions in the spinal cord involving the sensory tracts, or (4) a lesion in the cerebrum or sensory receptive area.

The chief difficulty in the loss of skin sensation is the effect that trauma may have upon the skin by its failure to be appreciated during application. When there is sensory loss in the hands as seen in syringomyelia the patient with a lighted cigarette may not realize that the burning end is attacking the skin of his fingers. A far more serious problem occurs in the loss of skin sensation in those parts of the body which are the object of prolonged pressure. The patient in these cases does not appreciate the noxious stimulant, and the pressure goes on to result in ischemia of the part with eventual loss of continuity of the skin. If the pressure continues, the loss becomes greater and body ulcers of considerable size may develop. This is especially true when the skin lies over bony prominences. The best treatment is prevention for there is little doubt that decubiti can be prevented in a great number of bedridden patients by a positive approach.

The best way to avoid decubiti is to keep pressure on the skin from becoming continuous and this is done by moving the patient. The patient should be turned at least once an hour to change the pressure areas. In the late 1940's the alternating pressure mattress was developed. Such a mattress placed under a cotton blanket used 24 hours a day has proved capable of not only preventing decubiti, but at times actually improving their condition. Other measures used to avoid constant pressure consist of placing patients on special beds or frames.

Other methods of treatment of decubiti are by sterilization and stimulation of the wound using either chemicals or ultraviolet radiation. The ulcers may be treated by the application of dry heat, massage to the peripheral area, and special dressings including preparations such as varidase, dried red cells, gentian violet, and even granulated sugar.

It is advisable to use a light flannel sheet which absorbs perspiration well and distributes the pressure more evenly. This does not allow the occurrence of hard creases or wrinkles. The use of lambskin has proved to be quite effective in treatment of decubiti.

One of the more important aspects of the management of the decubitus ulcer is related to the loss of protein through the large open wounds which may develop. It is therefore important that such patients during the course of treatment receive a high protein diet from the beginning.

Patients who have loss of skin sensation must be warned to avoid all types of trauma such as excessive heat, etc.

Healing of decubiti is usually delayed because of other atrophic disturbances, and in spite of the best care, there are some patients whose ulcers are so resistant to treatment or so large that plastic surgery becomes necessary. In such instances the use of full thickness grafts is usually recommended by plastic surgeons.

F. Bladder and bowel control—One of the most difficult and annoying aspects of chronic neurologic illness can be the loss of bladder and bowel control. In general the loss of bladder control falls into two main categories: (a) The bladder with a spastic outlet leading to bladder distention and overflow incontinence and (b) the bladder with an atonic outlet which leads to constant dribbling and a gradual loss of bladder capacity and contracture. In cases of lost bladder control the following principles of care are applied—promotion of drainage, prevention and treatment of infection, and prevention of bladder neck obstruction.

Adequate drainage may be obtained by periodic or constant catheterization. It must be stressed that these procedures frequently lead to infection and the utmost care should be exercised in the insertion or the manipulation of a catheter. Infections may be minimized by local or systemic medications as well as by regular irrigation and changes of the catheter. One must also be aware of incipient bladder neck obstruction and appropriate surgical measures should be considered. Close observation should be made for further complications such as ascending infections or calculi formation in the urinary tract with the reduction of renal function by increased pressure resulting in pyelo or hydronephrosis.

Bladder and bowel training are not only of medical but also of psychologic, social, and vocational importance. Bladder emptying may be promoted by training the patient through visual, auditory, or manual stimuli. The best known of the manual maneuvers is the compression of the lower abdomen, the so-called Crede maneuver. There appears to be some question as to the advisability of the Crede procedure.[10, 11] Intermittent clamping of the catheter may increase bladder capacity and by gradually increasing the duration may promote bladder automaticity. Fluid intake must be regulated and timed so that the bladder will not become distended during the night. Permanent urinary drainage either by conservative or surgical methods may be used if training is not achieved.

In the training of rectal elimination the following principles must be remembered—adequate fluid, adequate bulk, regularity. A minimum of 2,000 cc. of fluid every 24 hours will help the bowel as well as the bladder. Food intake providing adequate nutritional requirements and bulk should be available. Additional bulk is furnished by hydrophilic agents. Regularity is of outstanding importance. The early morning hours are usually the best and in the early period of training local stimulation and lubrication may be achieved by glycerine suppositories or other means. When necessary, digital stimulation may be used. Internal medication is available to soften the stool or to increase peristalsis. With sufficient perseverance regularity usually can be achieved.

Rehabilitation

Thus far we have discussed the physical restoration phase in the patient's care; the medical and surgical treatment must be considered concomitant with the other phases of rehabilitative medicine. These will include the social, psychological, economic, or vocational aspects. Of prime importance is the patient's family; readapting them to the patient's illness, his needs, and his physical and psychological fears, and the complete re-acceptance of him into the family unit. This may require psychologic, psychiatric, or ministerial help.

The patient's prognosis and amount of time he will be involved with physical care will determine our goals in rehabilitation. He may eventually be able to return to his full time previous occupation. His physical disability may scale down his ability to the point where he may be able to work only sitting at a desk or in a sheltered workshop in the community or even at home. If the patient achieves only self-care this may free a family member to work, and should be considered as a goal for that patient. The physician responsible for the patient can use community resources, family service agencies, social workers, vocational counselors, placement counselors, and others necessary to help in the patient's over-all care. Financial assistance for the patient may be obtained through appropriate public or private agencies. The orientation of the patient into his community program must be achieved before the patient is finally discharged from medical supervision. Re-adaptation to work and full community living may be a difficult phase for the patient, and a great deal of emotional guidance and assistance may be necessary for him. It is for these reasons that the patient must be well rehabilitated and integrated into his community and perhaps seen quite frequently during this final, but important phase of chronic neurologic illness.

(*This is the last of a series of two articles.*)

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A Clinical Note On Sigmoidoscopy Technic

H. David Frank, M.D. and Milton M. Lieberthal, M.D.

■ The technic of examination of the rectum and sigmoid by proctosigmoidoscopy may vary considerably, often because the examiner encounters difficulty in passing the instrument to its full length. It is the purpose of this report to describe a maneuver which may facilitate passage to full length in a greater number of instances.

After the introduction of the proctosigmoidoscope through the anal canal with obturator in place, the obturator is removed, in the usual fashion, to allow open-end visualization. It is then, either in the rectum or sigmoid, but more commonly in the latter, that folds of mucosa may be encountered which obscure the proximal lumen. Even after inflation with air this difficulty may persist. It is at this point in the examination that we have found a simple maneuver wth our metal suction tube to be of aid. The particular tube we use (Figure I) measures about 33 centimeters in length, and is bent at a convenient angle to adopt to the suction appartus. Its length enables the examiner to pass it through the 25 centimeter proctosigmoidoscope. Its outside diameter is only four millimeters, which allows easy visualization when the suction tube is in place inside the 18 millimeter internal diameter of the sigmoidoscope. The suction tube also has a seven millimeter perforated ball at its tip to prevent trauma during suction. This small sphere may be advanced well past the introduction lip of the proctosigmoidoscope. Its small diameter and rounded non-traumatic shape frequently enable it to be gently advanced into the concealed lumen under direct visualization. With the proximal lumen thus established the proctosigmoidoscope may then be advanced further into the bowel at the correct angle, and without dangerous and uncomfortable pressure being applied. This maneuver is quite similar in principle to the passage of the esophagoscope over a string previously passed into the stomach. With friable mucosa the suction should be turned off to minimize damage and bleeding while using the tube for this purpose.

It has been our experience that every bowel with unusual anatomic position or muscular spasm cannot be examined to the full length made possible by the instrument. However, some of the more difficult examinations are accomplished to greater degree or even completion by this simple procedure.

FIRURE I

Above the 25 centimeter sigmoidoscope is the metal suction tube described. Note that its length will allow passage well beyond the proximal lip of the sigmoidoscope.

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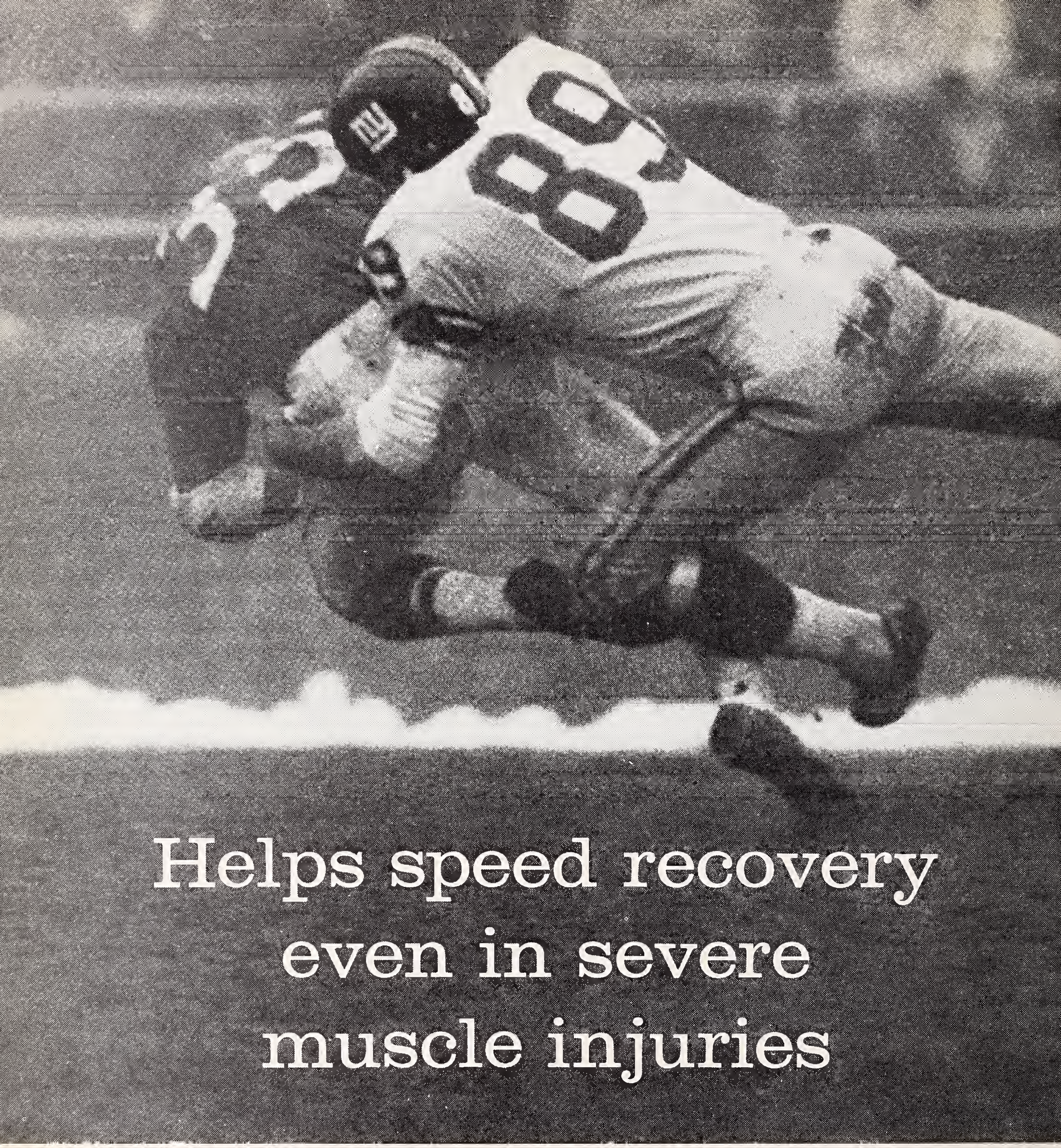

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CALL

SEMI-ANNUAL MEETING OF THE HOUSE OF DELEGATES

The 1963 Semi-Annual Meeting of the House of Delegates will be held at the Norwich Inn, 607 West Thames Street, Norwich, commencing at 2:00 o'clock in the afternoon of Wednesday, December 11th.

Morris P. Pitock, President
Michael R. Scully, Speaker of the House
Orvan W. Hess, Secretary

INTRODUCTION OF RESOLUTIONS

Article V, Section 12, Par. 3 of the Bylaws of the Society provides that:

All resolutions to be considered as regular business at any regular meeting of the House of Delegates must be in the hands of the Speaker not later than seventy-two hours before the opening of that meeting. All resolutions and recommendations published in the official agenda distributed to the members of the House prior to the meeting at which action is to be taken shall be considered as regular business. Resolutions presented later than seventy-two hours before the opening of a meeting will be referred for consideration as regular business by the House only when they are presented by the Council or accepted for consideration by majority vote of the delegates present. Any resolution which does not qualify in accordance with the aforesaid provisions for consideration as regular business may be accepted for action by a majority vote of the delegates present and, if so accepted, shall be referred at once by the Speaker to a reference committee. Any such reference committee shall consider resolutions referred to it and shall report, with recommendations, to the House before adjournment of the meeting.

PROPOSED AMENDMENT TO THE BYLAWS

The following proposed amendment to the Bylaws was presented to the House of Delegates on April 30, 1963 and was tabled for consideration and action at the next regular meeting of the House of Delegates.

In accordance with the Bylaws, this amendment will be published in Connecticut Medicine, "on one or more occasions prior to the next meeting . . . at which meeting the amendment shall be taken off the table and acted upon by the House of Delegates."

Introduced by the Council:

ARTICLE IV — MEMBERSHIP — Section 7. Discipline

The Council shall have the power to discipline a member for cause by a two-thirds vote of the members present and voting at any regular meeting or special meeting of the Council called for this purpose. At this meeting the accused member shall have the right to be present and represented by counsel. In its discretion, the Council may evoke for cause the following disciplinary measures against a member:

1. **Reprimand—The privileges of a reprimanded individual suffer no change in status.**
2. **Suspension—A suspended member remains a member of the Society. However, for the period of suspension, he shall lose two privileges only; namely, the right to vote and to hold office.**
3. **Expulsion—An expelled physician immediately loses all privileges and obligations to the Society. The Secretary shall remove his name from the roster of members. After a lapse of one year this physician may apply again for membership.**

COUNCIL MEETING SUMMARY OF ACTIONS

September 19, 1963

I. Attendance

Present in addition to the Chairman, Dr. Martin were: Drs. Pitock, Gilman, Cullen, Goldberg, Hess, Weise, Sr., Wilson, O'Connor, Bradley, Grendon, Grant, Davis, Phillips, Weber, Jr., Dean, Seigle, Gevalt, Egan, Abbot, Caplan. Also present: Dr. Richards. Absent were: Drs. Gardner, Scully, Hughes, Shepard, Ciccarelli, Spitz, Hastings, Medbury.

II. Routine Business

Approval Of Minutes

It was VOTED to approve the minutes of the meeting of July 17, 1963, as printed and distributed.

Life Membership

It was VOTED to approve the applications for Life Membership of the following eligble Active Members:

Morris Goldstein, New Haven (NHCMA)
Jacob B. Sigal, Hartford (HCMA)

Application For Associate Membership

Having received anapplication for Associate Membership from Mr. Charles V. Wynne, Administrator of the Waterbury Hospital, it was VOTED that this matter be referred to the Councilor from NHCMA for study and report to the Council.

Committee Resignations And Appointments

Conference Committee with the State Dental Association: It was VOTED to accept, with regret, the resignation of William J. Murray, Jr., New London, as Chairman of this Conference Committee. It was further VOTED to appoint Edward T. Wakeman, New Haven, to replace Dr. Murray as Chairman of the Committee for the remainder of the current year. Dr. Wakeman is a member of the Committee for 1963-64.

Committee on Third Party Payments: Having received a letter of resignation as Chairman of this Committee from Arnold H. Janzen, Hartford, it was VOTED to request the Chairman of the Council to speak personally with Dr. Janzen and obtain further information from him relative to his reasons for resigning before the Council takes further action in this matter.

Request From Committee

A request was received from Hugh K. Miller, Chairman of the Committee on Maternal Mortality and Morbidity, that the Council appoint a "temporary advisory council" to assist his Committee, the Committee on Hospitals, and the State Health Department in arriving at a decision on the question of "mixing clean gynecological cases on obstetrical floors." It was VOTED to inform Dr. Miller that he is authorized to proceed on his own and with Leopold M. Trifari, Chairman of the Committee on Hospitals to gather together such an "advisory council" to participate in discussions with other individuals and groups on the matter in question, but to report any recommendations arrived at *by the committees themselves* to the Council for prior review and approval.

House Of Delegates—Date And Place For 1963 Semi-Annual Meeting

It was VOTED to hold the Semi-Annual Meeting of the House of Delegates for 1963 on Wednesday, December 11, 1963, and it was further VOTED to inquire of the New London County Medical Association if it would wish to act as host for this meeting and, if so, to select and arrange for a suitable meeting site.

Election Of Student Member

It was VOTED to elect to Student Membership in the Society Mr. Robert B. Nathanson of Hartford. Mr. Nathanson is the son of Jules L. Nathanson, Hartford, and attends the Albany (N.Y.) Medical College, Class of 1966.

Transfer Of Budgeted Funds, Etc.

It was VOTED to authorize the following transfers of budgeted funds, and increases in allotments:

Connecticut Medicine: Transfer $1,200.00 from the printing budget of the Journal which was $36,600.00 reducing this figure to $35,400.00. To be transferred as follows:

$1,000.00 Postage and Handling—Journal.
$200.00 Printing and Postage—Office Operation.

Public Relations Department: Transfer of $375.00 from the following accounts: $200.00 from Exhibits, $75.00 from Publications and Reprints, $100.00 from Film Service Operations; and an additional allotment of $200.00 totalling $575.00 to be distributed as follows:

$250.00 PR Committee.
$325.00 PR Telephone.

Date Of Next Meeting

From the discussion held on this matter, it appeared to be the wish of the Council that the Chairman and the General Manager determine the date for the next meeting.

III. Old, New And Special Business

American Association Of Physicians And Surgeons, Inc.

Having received a favorable report on the purposes and activities of the AAPS from the headquarters of AMA, and on the working relationship which exists between the two organizations, it was VOTED to inform Henry L. Birge, Hartford, that the Council would be receptive to having the AAPS conduct an exhibit at the 1964 Annual Meeting to acquaint the members of the Society with AAPS objectives and, if desired, to offer them AAPS membership.

Report—Committee On Preliminary Study Of Censorship Questions

It was VOTED to accept the report and recommendations of the Committee on an appeal hearing requested by a lay person on a disciplinary decision of the Fairfield County Medical Association. The FCMA decision concerned the professional behavior of a physician member.

By accepting the report and recommendations of the Committee, the Council (the CSMS Board of Censors) ruled as follows:

1. That (the physician concerned) demonstrated competence in his care (of the patient) and that there was nothing to substantiate (the complainant's) charge of negligence on his part.
2. That a study of the record fails to disclose any evidence of "highhandedness" on the part of (the physician).
3. That this was an unfortunate case of incompatibility between (the physician) and (the complainant) for which both must share responsibility, since neither attempted to achieve the obvious cure which was the termination of their relationship.
4. That the Chairman of the Council notify (the two parties) and the Fairfield County Medical Association of these rulings of the Council.

Report—Ad Hoc Committee On Corporate Practice Of Medicine

It was voted to accept the report and recommendations of the Committee, presented by its Chairman, David A. Grendon. It was further VOTED to direct the Committee to consult with legal counsel for the purpose of advising the Committee on the question short of instituting a court action and, finally, that a decision to institute court action as recommended be referred to the House of Delegates at its next meeting.

Connecticut Medical Service, Inc.

The General Manager informed the Council that the hearing on the Society's court action against CMS, Inc. was expected to be concluded even while the Council meeting was still in session. He outlined the proceedings, which occupied almost three full days of the court's time, and enumerated the various members of the Society who had given testimony and some of the documents which had been introduced in evidence. He gave as his personal opinion the conclusion that, win, lose or draw in this particular situation, the Society should obtain initial and continuing legal advice in any and all future dealings it might have with CMS or with any other agency into which it proposed to enter into "agreements." He stated that it was his view that "good will" and "mutual trust and cooperation" should certainly continue to play an important part in conducting the business of the Society, but that unless the agreements arrived at were put down "in writing" it was likely that their definition and the degree to which they were legally binding on the parties concerned would present the same kinds of problems that have had to be dealt with in the CMS matter. Mr. Nickerson, of Wiggin and Dana, joined the Council somewhat later in the meeting and presented his evaluation of how the trial had gone and what he felt the prospects were for court decisions favorable to the Society's position. He stated that he believed a full and thoroughly documented case had been presented on behalf of CSMS and that he felt this represented an achievement of great importance. As to when the verdict would be handed down, he voiced the opinion that none should be anticipated before the middle or end of November.

Concerning an August 15 letter from the Executive Director of CMS which dealt with the question of joint meetings of the CSMS and CMS Liaison Committees, it was agreed that legal counsel would furnish the Chairman with the draft of a suitable reply to the communication.

Renewal Of Contract—General Manager

The Chairman announced that the General Manager had brought to his attention the fact that the GM's present five year contract with the Society will expire on May 14, 1964, and had given the Council (through him) the required six months notice of his desire to renew the contract. Dr. Martin appointed a subcommittee to study and report on this matter as follows: The President, Dr. Pitock; the Secretary, Dr. Hess; the Associate Councilor from MCMA, Dr. Egan; and the Chairman, Dr. Martin.

Death Of A Former CSMS Member

The Councilor from New Haven, Jachin B. Davis, brought to the Council's attention the recent death of Edward J. Ottenheimer of Arizona, a former member of the Windham County Medical Association and of the Society who served for many years as Councilor from WCMA. In recognition of Dr. Ottenheimer's passing, all members of the Council rose and observed a moment of silence.

The MAA (Kerr-Mills) Program

On June 27, 1963, the Council voted to ask Commissioner Shapiro of the State Department of Welfare to consider and reply to certain opinions held by the Council on matters pertaining to the Medical Assistance to the Aged plan being operated in Connecticut. Having reviewed Mr. Shapiro's answering letter and attached materials, it was felt that perhaps an "in-person" meeting with the Commissioner might serve to amplify some of his responses and clarify further the positions held by the Council and by his Department. It was therefore VOTED to direct the Chairman to appoint a suitable committee of Society representatives to arrange a meeting with the Commissioner and attempt to obtain the information sought by the Council, on June 27, and also to review further the necessity for massive transfer of Old Age Assistance patients to the MAA roles. The Chairman appointed the Committee as follows:

Ellwood C. Weise, Sr., Bridgeport
William E. Gatlin, Middletown.
Jack H. Galen, Derby.
Harold D. vonGlahn, Old Lyme.
Arnold H. Janzen, Hartford.
Max Caplan, Meriden.
Stevens J. Martin, Hartford.
John R. Egan, Old Saybrook.
William R. Richards, New Haven.

WNHC Radio And TV

E. Tremain Bradley, Councilor from FCMA, brought to the Council's attention an informal offer made (to him) by the owner of WNHC, New Haven, to furnish the Society with free TV and radio time in which to present medical programs of public interest. It appeared that the Society would be expected to work in cooperation with station personnel in the preparation and presentation of such programs. It was VOTED to refer this information to the Committees on Public Relations for study and recommendations to the Council.

N.B.: *The foregoing is a summary of the proceeding and actions of the Council on September 19, 1963. Detailed minutes of the meeting are on file at 160 St. Ronan Street, New Haven, for perusal by any interested member of the Society.*

NEW MEMBERS

FAIRFIELD COUNTY

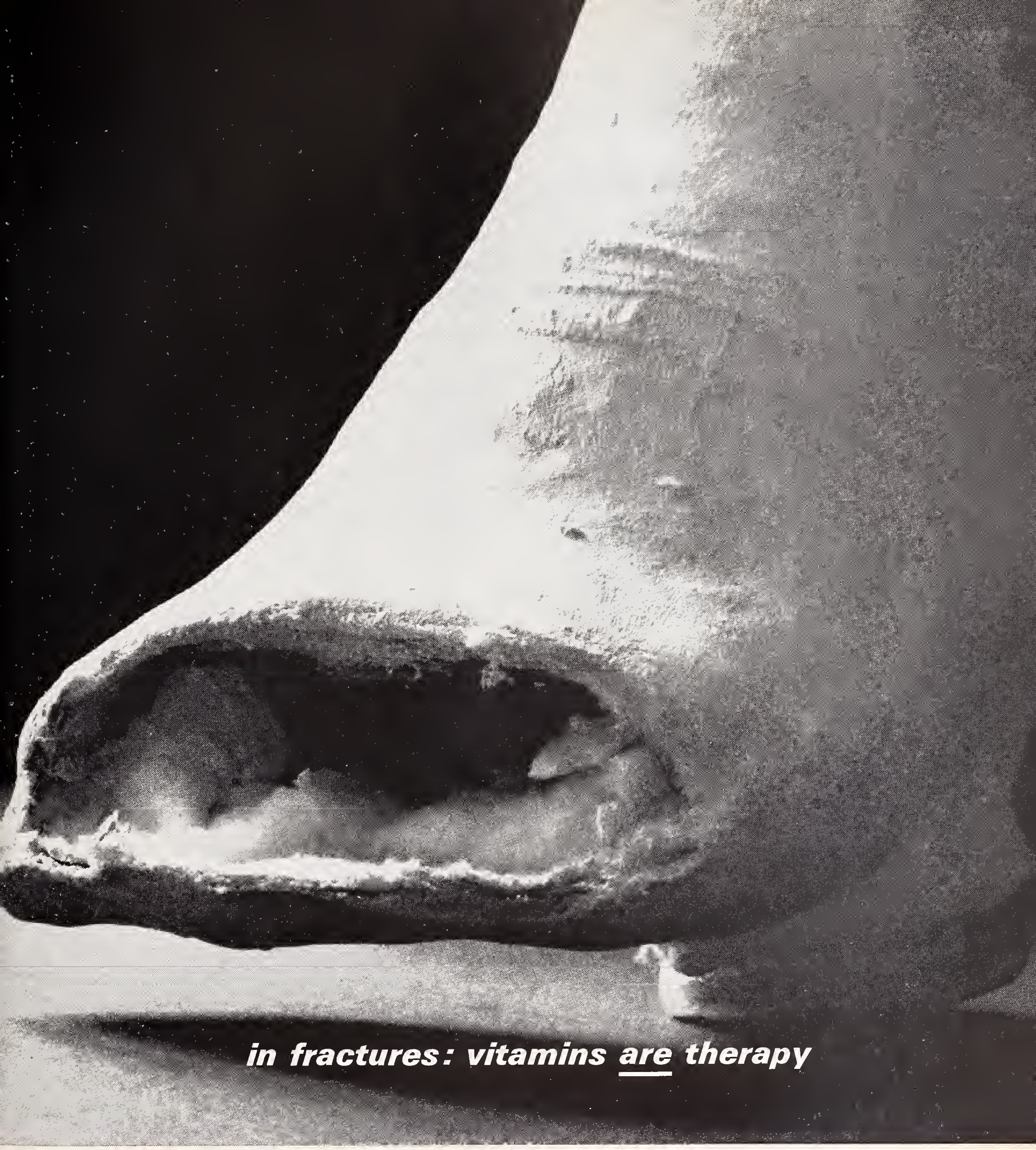
Jerome Barton, Norwalk
Robert T. Cassell, Westport
John A. Creatura, Bridgeport
Andrew M. Diggs, Danbury
Vincent P. Donnelly, Bridgeport
Donald S. Dworken, Bridgeport
Harry P. Engel, Bridgeport
Edwin G. Fernand, Danbury
Bertram H. Grossman, Norwalk
James E. Harshbarger, Bridgeport
Mary H. Heath, Greenwich
Kenneth E. Higgins, Fairfield
William Hillis, Greenwich
Peter E. Hope-Ross, Bridgeport
Raymond J. Keogh, Stratford
Charles Kilhenny, Danbury
Nam H. Lee, Bridgeport
Ronald M. Melmed, Stamford
George P. Meno, South Norwalk
Ralph A. Pesiri, Stamford
John F. Piro, Norwalk
John T. Queenan, Greenwich
Luis M. Ramirez, Bridgeport
John J. Sacco, Norwalk
Frederick E. Siefert, Old Greenwich
William C. Thomas, Jr., Bridgeport
Pietro Tomaino, Danbury

HARTFORD COUNTY

Joseph A. Amato, Hartford
Gerald I. Blank, New Britain
Cornelis Boelhouwer, Hartford
William P. Canty, Elmwood
Marion M. Castagno, Hartford
Jerry Crawford, Hartford
Lewis A. Dalburg, Jr., New Britain
Martin Duke, Manchester
Robert R. Eidlemann, Hartford
Hugh B. Friend, Hartford
Joseph J. Guardino, Manchester
Raoul M. Hansen, Hartford
George O. Howe, East Hartford
Albert C. Hurwit, East Hartford
Arthur B. Landry, Jr., Hartford
Michael Z. Lazor, Hartford
Paul S. Norman, Manchester
Donato A. Palermino, Hartford
Vincent J. Pito, Hartford
Herrick C. Ridlon, Hartford
Irving I. Rosenthal, Hartford
Malcolm S. Roth, Hartford
Joseph S. Sadowski, Hartford
Louis Schwartz, Hartford
Ray T. Smith, Jr., Hartford
Thomas F. Sneed, Hartford
John M. Thomas, Hartford

LITCHFIELD COUNTY

Alfred J. Finn, Jr., Harwinton
Melvin P. Hennisch, Winsted
Parviz B. Mehri, Danbury
Donald H. Peters, Kent



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New London County

Eugene C. Alver, Norwich
Jerome Bobruff, New London
Joaquin Dorantes, New London
Bernard M. Lavergne, Norwich
John A. Tighe, New London
Clemencio B. Torres, Norwich
Anthony D. Tramontozzi, Norwich

PLACEMENT WANTED

The Society's Placement Service is in receipt of the following:

General Practitioner, age 38—7 years solo practice. Associate or partnership with another general practitioner or general practice group.

David L. Lewis, M.D., age 31—M.D. University of Virginia School of Medicine. Specialty Orthopedic—available June 1964.

A. Taimour Eftekhari, M.D., age 32—M.D. University Tehran Iran 1956. Specialty Obstetrics-Gynecology. Licensed in Connecticut.

PLACEMENT OPPORTUNITIES

OTOLARYNGOLOGY. In the Hartford area. Sudden death of active practitioner leaves large practice and fully equipped office uncovered. Immediate hospital privileges available for qualified otolaryngologist desiring to assume responsibility.

PEDIATRICIANS. Part time temporary for State Crippled Clinics, Norwich and Windham, monthly and Hartford Office two to four days per month.

GENERAL PRACTICE. For sale in Fairfield County.

HOUSE PHYSICIAN. Diversified duties in small accredited voluntary hospital. Connecticut license required, $15,000 year.

INDUSTRIAL PHYSICIAN. Part time. Manufacturer with 2,600 employees. Hours 8:00 A.M.-12:00 Noon, Monday-Friday. Salary $8,000 to $9,000.

LITCHFIELD COUNTY. General Practice including obstetrics, vacancy left by busy practitioner.

INTERNIST. Available in the near future, salaried position in combined tuberculosis and chronic disease hospital.

ANYONE INTERESTED IN THE ABOVE IS ASKED TO COMMUNICATE WITH THE GENERAL MANAGER'S OFFICE, 160 ST. RONAN STREET, NEW HAVEN.

1963 MEETINGS

November 13-15 – New England Postgraduate Assembly to be held at Statler Hotel, Boston.

December 4—Annual Meeting of the Connecticut Society of American Board Surgeons, Inc. at Les Shaw's Restaurant, 70 Pond Lily Avenue, New Haven. Scientific Meeting to be held at 3:00 P.M. and dinner to follow.

December 11—Semi-Annual Meeting, House of Delegates of the Connecticut State Medical Society, to be held at Norwich Inn, 607 W. Thames Street, Norwich, Connecticut, at 2:00 P.M.

1964 MEETINGS

May 25-27—Annual Meeting American Thoracic Society Medical Section of the National Tuberculosis Association to be held in New York City.

June 14-19—The VII Interamerican Congress of Cardiology will be held in Montreal, Canada.

Doctor's Office

Joseph E. Allen, M.D., announces the opening of an office for the practice of internal medicine and psychiatry at 16 Franklin Street, Norwich.

John B. Berte, M.D., announces the opening of an office for the practice of internal medicine and pulmonary diseases at the Hamden Medical Center on 295 Washington Avenue, Hamden.

Martin Duke, M.D., announces the opening of an office for the practice of cardiology at 29 Haynes Street, Manchester.

Kenneth G. Goss, M.D., announces the opening of an office for the general practice of medicine at Elm Street, New Canaan.

William M. Reid, Jr., M.D., announces the opening of an office for the practice of general surgery at 47 Holmes Avenue, Waterbury.

Marvin Saltzman, M.D., announces the opening of an office for the practice of internal medicine at 49 East Main Street, Plainville.

John J. Stavola, M.D., announces the opening of an office in association with William E. Sherpick, M.D., for the practice of obstetrics and gynecology at 1 Mill Lane, Farmington.

STARTING TOMORROW MORNING this capsule can help one of your overweight patients do without her favorite (fattening) foods at meals—and during all the hours in between.

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Each No. 2 capsule contains 15 mg. of Dexedrine® (brand of dextro amphetamine sulfate) and 1½ gr. of amobarbital, derivative of barbituric acid [Warning, may be habit forming]. Each No. 1 capsule contains 10 mg. of Dexedrine (brand of dextro amphetamine sulfate) and 1 gr. of amobarbital [Warning, may be habit forming].

The active ingredients of the 'Spansule' capsule are so prepared that a therapeutic dose is released promptly and the remaining medication, released gradually and without interruption, sustains the effect for 10 to 12 hours.

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SIDE EFFECTS: Insomnia, excitability and increased motor activity are infrequent and ordinarily mild.

CAUTIONS: Use with caution in patients hypersensitive to sympathomimetics or barbiturates and in coronary or cardiovascular disease or severe hypertension. Excessive use of the amphetamines by unstable individuals may result in a psychological dependence; in these rare instances withdrawal of medication is recommended. It is generally recognized that in pregnant patients all medications should be used cautiously, especially in the first trimester.

SUPPLIED: Bottles of 50 capsules.

Smith Kline & French Laboratories SK&F *Prescribing information Jan. 1963*

Physiological Aspects Of Syncope

By Louis H. Nahum, M.D.

■ By definition syncope is a temporary loss of consciousness. Merely suffering from dyspnea, weakness, pallor, sweating and vertigo without loss of consciousness cannot be designated as syncope. The actual loss of consciousness always follows an inadequate supply of blood to the brain. The normal volume of blood which flows through the brain is approximately 650 to 700 m.l. of blood per minute. This amount flows through the brain even under extreme conditions and usually does not vary greatly from the normal value because the control systems are especially geared to maintain a constant cerebral flood flow. No change in total flow through the brain can be detected when a subject begins to think even if he is engaged in solving a stiff mathematical problem. Perhaps parts of the brain need slightly more blood during intense activity, as for instance looking at a bright field of vision, than during rest but it is only slight. The rate of flow increases if there is increased formation of carbon dioxide or increased utilization of oxygen. In short the local effects of carbon dioxide excess and oxygen lack constitute an automatic mechanism to maintain constant levels of blood flow. When these chemicals become abnormal they readjust blood flow until their concentrations become normal. When, however, the blood pressure falls below a critical level or the cerebral arteries narrow to reduce the flow then conditions are set up that can lead to syncope.

The brain in contrast with most organs of the body is unable to sustain its metabolism when oxygen is lacking. For this reason even temporary interference with its blood supply produces serious alterations in its function. This was demonstrated by occluding the arterial supply to brain with a blood pressure cuff about the neck that was inflated to a very high pressure.[1] The average time from arrest of the cerebral circulation to loss of consciousness was only six to eight seconds. Not total arrest alone, but partial arrest can produce loss of consciousness for when the cerebral blood flow was reduced to one-half normal values, loss of consciousness ensued.[2] Translating these experiments into clinical terms cessation of ventricular systole for a brief period of time or a fall in blood pressure that will reduce cerebral blood flow to one-half the normal value would lead to loss of consciousness. Ebert[3] in an excellent summary of the subject, covers the clinical syndromes associated with syncope.

The commonest form of cardiac syncope, of course, is that associated with A-V block, and termed the Stokes-Adams syndrome, although occasionally, transient ventricular fibrillation can also be considered as cardiac syncope. In aortic stenosis, syncope will typically occur only after exertion. Paroxysmal tachycardias, either atrial or ventricular, can so reduce the cardiac output as to lower the cerebral blood flow to less than half normal and so produce syncope. This can rarely occur in congenital heart disease. It is obvious that individuals with total or partial occlusion of one of the major arteries supplying the brain will develop syncope more readily than those individuals with a normal arterial supply. Other mechanisms that cause reduction in cardiac output, and therefore below critical values for normal cerebral function, is micturition syncope, and syncope associated with cough. Both are probably due to a sudden rise in intra thoracic pressure which in turn produces a corresponding rise in cerebrospinal pressure, which in some way deprives the brain of its blood flow. Micturition syncope[4] occurs in a man who is sleeping, suddenly arises to urinate, and faints in part because he increases his intrathoracic pressure by straining. The cough syncope[5] occurs in conjunction with an episode of violent coughing which greatly raises intrathoracic pressure, interferes with venous return, and sharply lowers cardiac output.

The remaining forms of syncope are generally associated with changes in the peripheral circulation. Some are due to vasodepressor syncope; some to postural hypotension[6] and more rarely some to the carotid sinus syndrome.[7] All of these can be understood if we recall the mechanisms involved in physiological adaptation to the upright posture. When a man stands, the pressure within the leg

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DR. LOUIS H. NAHUM, Lecturer in Physiology, Yale University School of Medicine, New Haven. Consultant in Medicine, Hospital of St. Raphael, New Haven. Griffin Hospital, Derby, Middlesex Hospital, Middletown. Cardiologist at Milford Hospital, Milford.

veins rises and they distend, containing more blood. This increases capillary pressure and sets up a movement of fluid into the leg tissues. The net result is a decrease in the volume of blood returning to the right heart and reduced filling pressure in the right ventricle. Without nervous control of the peripheral circulation, there would be a decrease in stroke volume, cardiac output, and a fall in arterial pressure. As a consequence of this, there could occur a totally inadequate cerebral blood flow and the individual would become unconscious. Syncope could come sooner if there is already impaired cerebral blood flow as a consequence of cerebral vascular disease. In short without nerogenic control of the circulation a person especially if he has cerebral vascular disease would be expected to faint in the standing position. Many iatrogenic experiments testify to the truth of this fact, since drugs that abolish the influence of the sympathetic nervous system on the heart and circulation, such as ganglonic blocking agents, or guanethedine, will produce hypotension and even fainting in the upright position. In short man's ability to maintain consciousness in the upright position is dependent on baroreceptor reflexes and the sympathetic nervous system.

The baroreceptors are located chiefly in the region of the carotid sinus and the aortic arch. If blood pressure rises, the stretch on the arterial walls leads to reflex vasodilatation and cardial slowing. If the arterial pressure falls, the stretch of the artery wall decreases, the discharge of impulses is diminished, reflex vasoconstriction and cardiac acceleration occurs to support the arterial pressure. The effect of these compensatory mechanisms mediated through the baroreceptors is to permit man to remain in the upright position without muscular exertion for a long period of time. In clinical terms a person who does not posses adequately these compensatory mechanism to maintain the arterial pressure in the upright position, suffers from postural hypotension.[6] Such a person shows little evidence of vasoconstriction in the upright position and when placed on a tilt-table, the arterial pressure will gradually fall as the table is inclined towards a 90° angle at which time there may occur loss of consciousness. The fact that this is a real failure of the sympathetic nervous system function is further evidenced by presence of importance and absence of epinephrine and norepinephrine in the blood in the upright position.[6] This type of syncope is usually associated with diseases of the nervous system such as diabetic neuropathy, sympathectomy, syringomyelia and hypothalamus involvements.

The commonest type of syncope is vaso-vagal, the usual faint. Many of us have experienced this at some time in our lives. The individual is standing passively or is in a hot room or on the parade grounds. Or perhaps he has experienced a loss of blood either internally or after phlebotomy. It occurs in about 5 per cent of blood donors with removal of 500 m.l. of blood and if a 1000 m.l. is removed approximately half will faint. Thus there is a clear relationship between the amount of blood lost and the incidence of vasodepressor syncope.

A variety of unpleasant experiences may also precipitate syncope. The sight of blood, disgusting events, severe pain of visceral origin and after a febrile illness, there can occur a fall in pressure due to sudden dilatation of peripheral vessels especially of the splanchnic bed and vagal slowing of the heart. It is not clear why the vaso-constriction and rapid pulse does not occur to compensate for the vasodilatation of the arterioles.

The cartoid sinus reflex has been amply discussed in a previous issue.[8] Spontaneous hypersensitivity of the carotid sinus appears to be an uncommon cause of syncope. But there are cases in which pressure on the carotid sinus has precipitated complete atrioventricular block and there are also rare instances in which tumors involving the carotid sinus have resulted in syncope. In individuals with cerebral vascular disease, minor changes in pulse rate and arterial pressure might produce cerebral ischemia and result in syncope.

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A special margarine for the atherosclerosis diet

The latest report* in the *JAMA* on atherosclerosis diets states, "...it appears logical to attempt to reduce high concentrations of cholesterol and other serum lipids as an experimental therapeutic procedure."

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*AMA Council on Foods and Nutrition: The Regulation of Dietary Fat, *JAMA* 181:411-423 (August 4, 1962).

**AMA Council on Foods and Nutrition: Composition of Certain Margarines, *JAMA* 179:719 (March 3, 1962).

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BOOKS RECEIVED

Books received for review are acknowledged in this department and such acknowledgement must be regarded as a sufficient return for the courtesy of the sender. Selection will be made for review in the interests of our readers and as space permits.

Review of Medical Physiology by William F. Ganong, M.D., Lange Medical Publications, Los Altos, California, 1963 577 pp. $6.50.

Review of Physiological Chemistry by Harold A. Harper, Ph.D., Lange Medical Publications, Los Altos, California 1963 437 pp. $6.00.

The Transitions from Ancient Egyptian to Greek Medicine by J. B. de C. M. Saunders, M.D., University of Kansas Press, Lawrence, Kansas, 1963, 40 pp. $2.00.

Reflex Testing Methods for Evaluating C.N.S. Development by Mary R. Fiorentino, O.T.R., with a Foreword by Burr H. Curtis, M.D., and Edited by Charles Weer Goff, M.D., Charles C. Thomas Co., Springfield Illinois 1963, 58 pp. $5.50.

Personnel in World War II. Medical Department United States Army, Office of the Surgeon General, Dept. of the Army, Washington, D.C., 1963 Editor in Chief Colonel John Boyd Coates, Jr., MC, USA, Editor for Personnel, Charles M. Wiltse, Ph.D., 548 pp. $6.00.

The American Review of Respiratory Diseases Conference on Newer Respiratory Disease Viruses., Bethesda, Maryland October 3, 4, 5, 1962. September 1963, Volume 88/Number 3. Part 2 of two parts. 432 pp. $3.00.

Elementary Medical Statistics by Donald Mainland, 2nd Edition, W. B. Saunders Co., Philadelphia, Pa., 1963, 381 pp. $9.00.

The Pathogenesis of Leprosy. Ciba Foundation, Study Group No. 15. Edited by G. E. Wolstenholme and Maeve O'Connor. Little, Brown & Co., Boston, Mass., 1963, 101 pp. $2.95.

Man and His Future. A Ciba Foundation Volume. Edited by Gordon Wolstenholme. Little, Brown & Co., Boston, Toronto, 1963, 410 pp. $6.00.

Principles of Neurological Surgery. By Loyal Davis, M.D., and Richard A. Davis, M.D., W. B. Saunders Co., Philadedphia, Pennsylvania, 1963, 608 pp. $15.00.

The Family and Human Adaptation. By Theodore Lidz, M.D., International Universities Press, New York, 1963, 113 pp. $3.00.

Normal Psychology of the Aging Process. Edited by Norman E. Zinberg, M.D., and Irving Kaufman, M.D., International Universities Press, New York, 1963, 182 pp. $4.50.

The Psychoanalytic Study of Society, Volume 2. Edited by Warner Muensterberger and Sidney Axelrad, International Universities Press, New York, 1962, 317 pp. $7.50.

Diseases of the Kidney. By Maurice B. Strauss, M.D., and Louis G. Welt, M.D., Little, Brown & Company, Boston, Massachusetts, 1963, 1033 pp. $32.50.

Around The State

Dr. Mayo Named Chief Medical Consultant

Dr. Charles Mayo, one of the foremost men in American medicine has become Chief Medical Consultant to the Mutual of Omaha Insurance Co.

Dr. Mayo will assume his new post concurrent with his retirement as senior surgeon of the famous Mayo Clinic in Rochester, Minnesota. He also served on the clinic's board of governors.

As Chief Medical Consultant to Mutual he will be concerned primarily with matters pertaining to Policyowners Service, Benefits, Underwriting, Rehabilitation and Hospital-Medical Relations.

Dr. Mayo is Chairman of the Board of Regents of the University of Minnesota and is Editor-in-Chief of *Postgraduate Medicine.* In 1955 he was recipient of the American Pharmaceutical Manufacturers' Association Award. He received the Modern Medicine Award for Distinguished Achievement in 1957.

Dr. Mayo will continue as a member of the Mutual Board of Directors. He will maintain his home in Rochester.

ERRATUM

The Fairfield County Medical Association makes known that the recently reported obituary of Dr. Abraham Bernstein, of Bridgeport, was in error.

Dr. Bernstein has informed that office that his obituary is quite premature and that he is in the unusual position, seldom given to a man, to live long enough to refute his own obituary.

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Special Notices

DIABETES WEEK

November 17-23, 1963

Dr. Thomas P. Sharkey, President of the American Diabetes Association, will be the guest speaker at the New Haven Medical Association, 364 Whitney Avenue, on Wednesday, November 20 at 8:30 p.m.

The meeting is in connection with DIABETES WEEK in Connecticut and all physicians are invited to attend.

CLINICAL PATHOLOGISTS NAMED

The Laboratory for Clinical Medicine, Madison Towers, 111 Park Street, New Haven announces the appointment of Peter B. Hukill, M.D. and Romeo A. Vidone, M.D., as Clinical Pathologists.

YALE UNIVERSITY SCHOOL OF MEDICINE POSTGRADUATE CONFERENCES

at

Manchester Memorial Hospital

Manchester, Connecticut

1963-1964

11:45 A.M. to 1:00 P.M.

September 24—Dr. Carl F. von Essen, "The Role of Radiation Therapy in Cancer."

October 29—Dr. Walter R. Thayer, Jr., "Vascular Diseases Involving the Gastrointestinal Tract."

November 26—Dr. Robert Turfboer, "Psychological Aspects of Alcoholism."

January 28—Dr. Patrick J. Mulrow, "Advances in Diuretic Therapy."

February 25—Dr. Harold O. Conn, "Management of Hepatic Cirrhosis and Its Complications."

March 31—Dr. Stuart C. Finch, "Bleeding Disorders."

April 28—Dr. Ira S. Goldenberg, "Management of Acute Abdominal Trauma—Penetrating and Non-Penetrating Wounds."

May 26—Dr. Donald F. Egan, "Drowning."

MOVIE ON PROJECT HOPE IN PERU

December 11, 1963

On Wednesday, December 11, 1963 at 5:00 p.m. a professionally made sound movie will be shown in the Harkness Auditorium, Yale University School of Medicine. The film, which runs 28 minutes, describes the medical care and teaching activities carried out by Project HOPE in Peru between May 1962 and March 1963. Dr. Donald P. Shedd of New Haven will be available to answer questions about the project. Connecticut doctors and dentists are invited to attend.

ALBANY MEDICAL COLLEGE OF UNION UNIVERSITY

Announces

FIFTH POSTGRADUATE MEDICAL SEMINAR CRUISE

January 8-22, 1964

A 14-day cruise from New York via Swedish American Line vessel M.S. Gripsholm. Ports of call are: St. Thomas, St. Lucia, Port of Spain, LaGuaira, Curacao, Montego Bay.

Members of the Albany Medical College faculty will present a comprehensive postgraduate medical program, covering subjects in internal medicine, surgery, and psychiatry. The medical seminar constitutes 23 hours of Category I credit toward the postgraduate requirements of the AAGP.

For information, write to:
Department of Postgraduate Medicine
Albany Medical College
Albany 8, New York

SEVENTH ANNUAL INSTITUTE FOR PHYSICIANS

Week of March 2, 1964

The Program of Continuation Education—Public Health of the Columbia University School of Public Health and Administrative Medicine will announce the Seventh Annual Institute for Physicians in industry. The one week course will be held at the Columbia-Presbyterian Medical Center complex in New York City during the week of March 2, 1964. Four intensive courses which relate specifically to the field of occupational medicine, as well as providing general background material in public health, will be offered.

Further information and applications may be obtained from the Program of Continuation Education—Public Health, Suite 305, 21 Audubon Avenue, New York 32, New York.

COURSE IN LARYNGOLOGY AND BRONCHOESOPHAGOLOGY

March 16-28, 1964

The Department of Otolaryngology, University of Illinois College of Medicine, will conduct a postgraduate course in Laryngology and Bronchoesophagology from March 16 through 28, 1964, under the direction of Paul H. Holinger, M.D.

Registration will be limited to fifteen physicians who will receive instruction by means of animal demonstrations and practice in bronchoscopy and esophagoscopy, diagnostic and surgical clinics, as well as didactic lectures.

Interested registrants will please write directly to the Department of Otolaryngology, University of Illinois College of Medicine, 1853 West Polk Street, Chicago 12, Illinois.

DERMATOLOGY MEETING

November 30 - December 5

The American Academy of Dermatology will hold its 22nd annual meeting November 30-December 5 in Chicago. Details may be had by writing AAD, 420 Lexington Avenue, New York 17, New York.

MAJOR MEDICAL EXPENSE PLAN

A NEW SPECIAL ENROLLMENT PERIOD ALLOWS YOU TO APPLY FOR AN IMPROVED CONTRACT

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ACCIDENT AND HEALTH PLAN

In addition to the above, members up to age 40 may now purchase their Accident and Health protection at a 25% reduction in cost.

Through its continued official sponsorship of our Group Plans, The Connecticut State Medical Society has once again made it possible to offer broadened coverage under these two time-tested policies to members of the Society. If you are not now enrolled, do not turn your back on old friends who have served Connecticut physicians for over a quarter of a century. If a sufficient number of new applications are submitted for the Major Medical Expense Plan, all policies will be issued regardless of past medical history. For full information write or phone.

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Semi-Annual Meeting

Plans are complete for the semi-annual meeting of the Woman's Auxiliary to the Connecticut State Medical Society to be held Tuesday, November 12, 1963 at the Race Brook Country Club in Orange. The Auxiliary is honored to have as their guest speaker Mrs. C. Rodney Stoltz of South Dakota, President of the Woman's Auxiliary to the American Medical Association. Her subject will be "Serve and Communicate."

Members are urged to make their reservations NOW and send their checks for $3.75 to Mrs. Ellwood C. Weise, 42 Hilltop Drive, Trumbull, Connecticut.

The business meeting will open at 10:00 A.M. with registration and coffee, and the luncheon will begin at 1:00 P.M. To locate the Race Brook Country Club take exit 57 from the Merrit Parkway and proceed North or South to Derby Avenue. Follow Derby Avenue to sign of the Race Brook Country Club.

Connecticut Advisory School Health Council

Mrs. Dewey Katz, the Auxiliary's delegate to the Connecticut Advisory School Health Council reports that the documents prepared by the Council entitled "Recommendations Regarding Health Examination For School Personnel" (revised December, 1962), "Suggested Procedures For Protection And Release Of Children While In School," and "Functions And Qualifications Of School Medical Advisor" January, 1961 (which is a revised edition of the June, 1957 document), are ready for distribution. Any physician or auxiliary member may obtain them from Miss Ruth Byler, State of Connecticut, Department of Education, P. O. Box 2219, Hartford 15, Connecticut.

Health Careers

Every county in the State, including Tolland, now has a Health Careers Chairman. Each one has received a Guidance Counselor's booklet and suggestions for this year's program.

Dr. Max Caplan of Meriden heads a committee of men who will personally distribute the booklet to each of the 128 high schools and 91 junior high schools in the State. The response to the booklet is excellent. Distribution has already covered all public libraries, physicians, dentists, allied associations and other state medical societies.

Statistics for the 1962-63 school year are completed. The Connecticut State Medical Society office received a total of 547 inquiries from juniors and seniors in our high schools. Of these, 222 requested information about scholarships while 157 did not feel the need of financial help. The breakdown as to the career information is as follows: Physicians 60, Medical Recording Librarian, 15, Medical Secretary 49, Nursing 172, Practical Nursing 6, Occupational Therapy 7, Physio-Therapy 53, Pharmacy 20, Medical Technician 68, Medical Social Work 2, X-ray Technician 3, Radium Technician 33, Dietetics 18, Sociology 4, Dental Hygiene 3, Laboratory Technician 3, Public Health 15, Veterinarian 3 and Dentist 1.

All of the above inquiries were answered by our cooperating agencies.

Legislation

Plans of the legislative committee for the coming year were reported at the State Workshop. These include:

1. Formation of active legislative committees in each county with representatives covering every town and city. These committees to be ready to

pass on information, distribute literature, make phone calls, and write letters when requested to do so.

2. To offer and be ready to give help to the County Medical Associations in the "Operation Hometown" programs.

3. Although it is unlikely that there will be any state legislation during this year, since there is to be no regular meeting of the State Legislature, Auxiliary members are urged to become interested and active in local politics, and helpful in the elections with the parties of their own choice.

4. We may be called upon to work against King-Anderson type legislation. At present the bill is titled, The Hospital Insurance Act of 1963—H.R. 3920.

Each County Legislative Chairman has received material on "Operation Hometown," a copy of the basic program for legislation planned by the National Auxiliary Committee on Legislation, and a copy of the basic program for our state committee.

With this material on hand for all members we look forward to a successful year.

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Letters To The Editor

DIABETES WEEK
November 17-23

To The Editor,

DIABETES WEEK this year will mark the Forty-Second anniversary of the discovery of insulin. It was on November 14, 1921 when the first communication was made by Banting and Best reporting the discovery of insulin before the Physiological Journal Club of the University of Toronto. A simple announcement appeared on the bulletin board of the Department of Physiology listing Dr. Banting and Mr. Best for a seminar on November 14th at 4:00, in Room 17. Their subject, "Pancreatic Diabetes."

Of special interest to Connecticut is the notable fact that the first public report of the epoch making research which led to the discovery of insulin was made in New Haven on December 1921.

Since then this unheralded discovery of insulin opened unending opportunities for endocrine and metabolic research.

Barnett Greenhouse, M.D.

New Haven, Conn.

To the Editor:

I should like to commend you on your editorial "The Electrocardiogram is Not the Doctor."

I have just gone thru the harrowing experience of trying to undo the harm in two patients who suffer from iatrogenic cardiophobia. In both instances the condition was aggravated by rejection of their applications for life insurance. In both cases an "abnormal electrocardiogram" adduced as sole evidence of cardiopathy. If possible, I should like to have copies of your editorial to submit to insurance companies in cases of this kind.

Yours truly,

Stamford, Conn. S. Allison Rose, m.d.

To the Editor:

Two recent articles concerning lead poisoning have appeared in newspapers citing the statistic, "70 per cent of deaths due to poison in the pre-school age group are caused by lead poison." We have looked into this allegation thoroughly and find it to be in error.

In order to set this matter to rights, and perhaps forestall subsequent reprints of this erroneous report, we cite the United States Department of Health, Education, and Welfare Public Health Service, Division of Accident Prevention report dated December, 1962. In 1960 (the last year recorded), 445 deaths due to accidental poisoning involving children under 5 years of age are recorded. Seventy-eight of these, or *17.5* per cent, are attributed to lead and its compounds. Over the ten-year period covered in this report, 1951 through 1960, the percentage figure stands at 12.5 per cent.

This office will be pleased to help you with all statistical and other matters related to lead toxicology.

Sincerely,

Don G. Fowler,
Director of Health and Safety
Lead Industries Association,
Inc. New York, N.Y.

OBITUARIES

Edward J. Ottenheimer, M.D.
1898 - 1963

On September 17, 1963, Dr. Edward J. Ottenheimer, one of Connecticut's distinguished men of medicine, died in the Good Samaritan Hospital in Phoenix, Arizona. Dr. Ottenheimer was born in Willimantic, Connecticut on September 22, 1898, of Irish and German ancestry. Following graduation from the local high school, he obtained his college and medical school education at the University of Virginia, receiving a B.S. degree in 1918 and a M.D. degree in 1922. His surgical training began at Bellevue Hospital in New York City and culminated at the Massachusetts General Hospital in Boston. Returning to Willimantic in 1925, he became associated with the late Dr. Owen O'Neill in the private practice of surgery. He was made chief of surgery at the former St. Joseph's Hospital in 1928 and continued in this capacity in the Windham Community Hospital after its opening in 1933. He remained chief of surgery until his retirement in June, 1961 and also serving as chief of staff during his last three years in practice.

In World War II, Dr. Ottenheimer's distinguished military career began with the activation of the 39th General Hospital (Yale Unit) in June, 1942. In New Zealand, he served as chief of the Surgical Service during an interval in which this hospital admitted more than 23,000 sick and wounded from the Solomon Islands Campaign. Later, assigned as chief of the Surgical Service to the 148th General Hospital in Saipan, he expedited the surgical care of thousands of battle casualties from the Iwo Jima and Okinawa Campaigns. In recognition of his leadership, professional talent, and superior administrative ability, he was promoted to the rank of Colonel and twice awarded the Bronze Star. He was then made surgical consultant in the Western Pacific and was subsequently moved to Honolulu as surgical consultant in the Central Pacific area.

The goal of professional perfection motivated this selfless surgeon. The screening of new techniques and methods, and the adoption of those of value to him, was a fascinating hobby. Early foresight dictated the necessity for better medical facilities in his own community. Largely as a result of his personal efforts and persuasive enthusiasm, the Windham Community Hospital came into being in 1933. He envisioned the need of a statewide statistical study of cancer. He was one of a small number of colleagues responsible for establishing the Cancer Registry of Connecticut, which has since served as a model for adoption by many other states. Though not numerous, his contributions to surgical literature were important and well received. A paper on "Cancer of the Stomach," delivered before the American College of Surgeons, gained him national recognition and membership on the National Cancer Committee.

As a talented teacher, he remained associate clinical professor of surgery at Yale until his retirement. He was dedicated to the conviction that better medical care results from cooperative endeavor. To perpetuate this ideal, he formed a surgical group and brought with him other highly trained surgeons. Despite the burden of a large private practice, he devoted time and energy without stint to innumerable committees. He received many honors. He served as president of the Windham County Medical Society, the Connecticut Cancer Society, the Connecticut Society of American Board Surgeons, and as a governor of the American College of Surgeons. His professional attainments were rewarded with membership in the New England Surgical Society, the Eastern Surgical Society, the New England Cancer Society, the Society of Consultants to the Armed Forces, the American College of Surgeons and the Connecticut State Medical Society.

The multi-faceted character of this man, who led the full life, cannot be portrayed by recount of intellectual brilliance or professional achievement. Endowed with kindliness, warmth and unbounded generosity, his personality exerted a magnetic and hypnotic social charm. His hobbies were few; on the varsity team in college, baseball remained his first love. Oil painting and writing gave him pleasure, especially after retirement. He was unaware that his actual avocation was that of making friends. How well he succeeded will be written in the hearts of countless patients and intimates who loved him and called him "Eddie" and now lament his passing. His sound philosophy, erudition, wit, gaiety and optimism made life on this earth a better and happier place for all of those with whom he came in contact.

Dr. Ottenheimer is survived by his widow, Dorothy; two sons, Dr. Edward J., Jr., pediatrician of San Diego, California, and John, architect with Frank Lloyd Wright Associates; a daughter, Mrs. Henry Glover of Simsbury, Connecticut; four sisters, Mrs. Ernest Opperman, Goshen, Connecticut, Mrs. Hugh McQuade, Chaplin, Connecticut, Mrs. Robert Bligh, Wellesley Hills, Massachusetts, and Mrs. Percy Spencer, Waban, Massachusetts, and five grandchildren.

James W. Major, M.D.

Raymond A. Weitzel, M.D.
1928 - 1963

Dr. Raymond A. Weitzel, associate pathologist at Manchester Memorial Hospital, died at his home August 7, 1963. He had been afflicted with multiple sclerosis for years but had been able to work to the time of his death.

Dr. Weitzel was born May 2, 1928, in Philadelphia, Pennsylvania, a son of Mrs. Helen Price Weitzel and the late Raymond A. Weitzel.

He received his pre-medical education at the University of Pennsylvania and graduated from Temple University School of Medicine in 1952. He interned at Hahnemann Hospital, Philadelphia and was resident pathologist at Mallory Institute, Boston City Hospital, from 1955 to 1958, and at the Memorial Center, New York City, from 1958 to 1959. He served as associate pathologist at Vassar Brothers Hospital, Poughkeepsie, New York, from 1959 to 1961. In May 1961, he joined the staff of the Manchester Memorial Hospital as associate pathologist where he served until the time of his death.

He had served in the U. S. Army Medical Corps in Germany from 1953 to 1955 and had held teaching appointments at Tufts University Medical School and Harvard Medical School from 1957 to 1958.

Dr. Weitzel was a life long naturalist with a particular interest and extensive knowledge of Ornithology.

He was respected by his colleagues. His counsel was frequently sought and willingly given. He is particularly remembered for his patience, humor and kindness.

He was a member of the Hartford County Medical Association and the Connecticut State Medical Society.

Dr. Weitzel is survived by his wife, Mrs. Jacqueline Weitzel, and by his daughter, Pamela, and three sons, Eric, Grant and James.

John R. Eddy, M.D.

Lawrence A. Gardy, M.D.
1911 - 1963

Dr. Lawrence A. Gardy was born in Miscolc, Hungary on August 22, 1911. He received his scholastic and pre-medical education in Hungary, and his medical education in Italy, graduating from the Medical School of the University of Bologna in 1937.

In 1939, Dr. Gardy came to the United States, and to Hartford to serve an internship at Mt. Sinai Hospital. Following this, he next served an internship at the Alexian Bros. Hospital in Chicago. Then from 1942 to 1944 he served as a surgical resident at Mt. Sinai Hospital in New York. In

1942 he became a United States citizen. From 1944 to 1947 he served in our Armed Forces, attaining the rank of captain in the Medical Corps and served overseas in the European Theatre of Operations.

After his discharge from the Army, Dr. Gardy returned to Hartford and began the practice of General Medicine.

From 1958 to 1961 he served as a resident in otolaryngology at Bellevue Hospital and the Albert Einstein School of Medicine in New York City.

In July of 1961 Dr. Gardy began the practice of otolaryngology in Hartford, opening his office at 449 Farmington Avenue.

He was a member of the staff of Mt. Sinai Hospital, the courtesy staff of St. Francis Hospital and co-ordinator of the otolaryngology services of the Albert Einstein School of Medicine. He was a member of the Hartford County Medical Association, the Connecticut State Medical Society and the American Medical Association. While in the field of otolaryngology for a short period, he had contributed several articles to the otolaryngological journals.

Dr. Gardy, or "Larry" as he was known to his friends, was interested in photography and his subjects included both the scientific as well as the nonscientific variety. He enjoyed playing golf and was formerly a member of the Indian Hill Country Club. He was very proud of his American citizenship and was an ardent student of American history.

Larry was a sincere and warm friend and his untimely death on September 10, 1963 of coronary thrombosis has taken from the community a man who had so much good to contribute.

He leaves his wife, Eva Joseph Gardy, a son, James and a daughter, Susan who is a student at Simon's College in Boston.

Frank E. Roth, M.D.

Thomas Harman Denne, M.D.
1882 - 1963

Dr. Thomas Harman Denne, who died August 30, 1963 at the Hartford Hospital following a heart attack, was born September 24, 1882 in Seneca Falls, New York. He attended the public schools there and in Waterloo, New York and later a college in Richmond, Virginia. In 1905 he received his M.D. degree from the College of Medicine of the University of Vermont and began his career as an assistant surgeon in the United States Marine Hospital Service for a period of two years. He then settled in Bloomfield, Connecticut as a general practitioner and later moved to West Hartford, Connecticut to continue his practice there.

In 1918 Dr. Denne joined the Travelers Insurance Company as a home office physician to the employees. Eventually he organized the Department of Medicine and Hygiene of which he was director and superintendent. This department served to examine, supervise, and advise the company's large number of employees, including those in the branch offices, regarding their health. Shortly thereafter he established the Travelers Rest House for the company employees in West Suffield, Connecticut. Under Dr. Denne's supervision the department became a model example of industrial and preventive medicine which was followed by other companies in caring for the health of their employees.

Dr. Denne was a fifty-year member of the Connecticut State Medical Society and served as president of the Hartford Medical Society. He also belonged to the Hartford County Medical Association and the American Medical Association.

He was widely known to the doctors of the Hartford area and was highly regarded by them. He helped to promote radio broadcasts for Child Health Day and was active in numerous civic and medical programs. In addition to various fraternal and social societies, he was a former member of the Commission of Health, Home Service Organization and Civic Defense in West Hartford.

Dr. Denne had great devotion to his family which was a source of pride and joy to him. His grandson spent much time with him and it gave him pleasure when he entered his alma mater, the University c Vermont. His ability to make friends was an outstanding characteristic. This, with his ability to recall and relate stories of past experiences and events, made him a welcome guest and a congenial host to all who were fortunate enough to know him.

He was an inspiration to his co-workers, patients, and friends who held him in great esteem and whoever among these sought his advice got to know him as a wise counselor who had much sympathy and understanding and ever ready to help. All those who were privileged to count him as a friend will remember him as a man of affectionate nature, great integrity, and sound judgment and will miss him.

He leaves his wife, Mildred Gregory Denne; two daughters, Mrs. C. Lee Babin and Miss Virginia Denne; three sons, Thomas H. Denne, Jr., R. Gregory Denne and Keith K. Denne; a brother, William Denne; also five grandchildren.

William W. Wright, M.D.

In Memoriam

Sunderland, William A.—Danbury; Yale University School of Medicine, 1926. Dr. Sunderland was attending surgeon at the Danbury Hospital. He was a member of the Fairfield County Medical Association, the Connecticut State Medical Society, and the American Medical Association. He was a fellow of the American College of Surgeons, and the New York Academy of Medicine. Dr. Sunderland died August 22, at the age of 63.

Willner, Otto—New Haven; University of Vienna Medical School, 1905. Dr. Willner was assisting physician in the Yale Department of Health and conducted a private practice as an internist in New Haven. Dr. Willner was on the courtesy staff at the Grace-New Haven Community Hospital. He was a member of the New Haven County Medical Association, the Connecticut State Medical Society, and the American Medical Association. Dr. Willner died October 2, at the age of 82.

1964 Opportunities In The Peace Corps

The Peace Corps estimates that it will require at least 9,000 volunteers to meet the requests of host country governments in 1964.

These needs include: 5,000 teachers, 2,000 community development workers, 700 health workers, 600 agricultural technicians and 700 skilled tradesmen, technicians and professional personnel.

The greatest demand is for teachers—3,000 for secondary schools, 1,000 for elementary and 500 for colleges and universities. An additional 500 volunteers are needed for the fields of physical, vocational and adult education.

In the field of health, 500 nurses of all kinds are needed. Another 200 persons will fill posts as medical, laboratory and X-ray technicians, doctors, dentists, sanitarians, etc.

While the demand for agricultural skills cover a wide range of subjects, these skills are most frequently requested: agricultural extension, irrigation, farm mechanics, animal husbandry, agricultural engineering, poultry, dairying and soil conservation.

The Peace Corps is interested in volunteers who are planning to retire and also those eligible for a leave of absence from their present employment.

Applicants are advised to submit an early application if they want to be considered for either a February or June appointment. An application form may be secured from the Peace Corps, Division of Recruiting, Washington, D. C. 20525. Special literature will be sent to those indicating the particular area of their skill and when they would probably be available.

Industrial Injuries Result From Mental Process

On-the-job injuries result from a psychological process, a study of some 300 industrial accidents indicated recently.

An analysis of case histories revealed certain patterns of behavior which preceded the mishaps, according to Drs. Alexander H. Hirschfeld and Robert C. Behan, Detroit.

In fact, they said, these patterns were so sharply defined it may be possible with further study to predict and, therefore, prevent such accidents.

Writing in the current *Journal of the American Medical Association,* they said:

"Before the accident occurs there is a state of conflict and anxiety within the patient. As a result of this condition the worker finds a self-destructive, injury-producing act which causes his 'death' as a worker. From this moment the patient reacts exactly as do other psychiatrically ill people, except for the character of his symptom. Instead of having a presenting complaint of anxiety, depression, or other classical psychiatric symptoms, he has the physical disorder which is the result of his accident."

Describing typical behavior before accidents, the physicians said many skilled workers seem suddenly to do things which novices would not make the mistake of doing. Safety rules are often broken, they said, and several infractions frequently occur at the same time.

As an example, they said, workers were injured after repeatedly walking through well-recognized and marked danger areas without wearing protective helmets. When asked to explain this conduct, they said, the patients gave reasons that were "vague, or even silly, in every case."

NEW BOOKS IN REVIEW

PSYCHOLOGICAL DEVELOPMENT IN HEALTH AND DISEASE by George L. Engel, M.D., W. B. Saunders Co., Philadelphia, Pennsylvania, 1962, 435 pp. $7.50.

Reviewed by: LOUIS H. NAHUM

There are three parts to a persons illness, his physical illness, his psychological reactions to it and his social relationships. The interaction of these factors is what we see when we deal with a sick person. Nevertheless, a glance at any modern textbook of medicine reveals data only about his physical illness.

Medical schools have been becoming recently aware of the lack of training about man's thoughts, emotions and their effects on his body. The central and pervasive concern in the teaching of undergraduate medical students is to see to it that tomorrows physician must be better informed than was his predecessors about medicine in human as well as basic science terms. The physician must learn many things about psychology and sociology of his patient and his family. And he must learn ways and methods that are necessary to obtain relevant data about the social and psychological determinants of his patients illness, as well the physical factors.

The author of this book began as a clinician and ended up as a psychoanalyst. But he has maintained his contact with the patients on the wards. This book has, therefore, evolved out of twenty years of his teaching of psychological concepts to medical students and house officers at the University of Rochester. Its major theme is that of human psychological developments and its relation to health and disease. Its orientation reflects a background and long interest in biology and investigation in the field of internal medicine and education in clinical psychiatry and psychoanalysis.

The book consists of thirty chapters in two parts.

Part One deals with psychological development. Covered, are biological considerations, instincts, drives, homeostasis, the nervous system, the mental apparatus, stages in the development from birth to adulthood. The development of man, the development of woman, the family, and the psychoanalytic theory of behavior. Part Two consists of ten chapters presenting a unified concept of health and disease and psychological responses to major environmental stress; grief, mourning, danger, disaster and deprivation. There is a magnificent chapter on psychological stress and several on psychiatric diseases. There follows an authors index and a subject index.

Out of this classic book, will come a great deal of knowledge about mental mechanisms and the operation of the unconscious mental mechanisms. The student will learn many ways in which somatic disturbances of varying types can come about in response to psychological stress. He will learn that no duality exists between the so-called psychiatric and the organic disease in respect to either etiology or clinical expression. The book focuses the physicians attention on the patient who is manifesting illness, not simply on the disease, because an important common denominator underlying health and disease is psychological stress which directly or indirectly determines not only the individual's capacity to cope with other stresses but often his exposure to such stresses as well.

Heretofore, medicine has been in a biochemical revolution and one which is actively in progress now. The next great advance in medicine will probably evolve through the study of the brain and behavior. This excellent volume should be read and re-read by every student and practitioner, because it abolishes the dichotomy between mind and body and considers mental mechanisms and physical mechanisms, and helps focus attention to the patient who is manifesting illness, not simply on a disease.

PRIMER OF CLINICAL MEASUREMENT OF BLOOD PRESSURE by George E. Burch, M.D. and Nicholas P. DePasquale, M.D., C. V. Mosby Co., St. Louis, Missouri, 1962, 141 pp. $5.50.

Reviewed by: LOUIS H. NAHUM

No patient is adequately examined unless his blood pressure is properly recorded. Nevertheless, arterial pressure is fickle and the ill-informed and unprepared physician is readily confused and his patient might be erroneously treated. This is especially true and in fact, frequent in hospital practice where blood pressure recordings are made by nurses.

Accuracy is possible only when the principles and techniques of recording blood pressure are completely understood. There are many pitfalls all thoroughly considered in Chapter 4 of this classic monograph. There is the error from improper positioning of the extremity, of deflating the cuff too rapidly or too slowly, of recording the first blood pressure, of failure to have the mercury column vertical, of the auscultatory gap, of improper application of the compression cuff. Then there are errors which arise from failure to consider the patient adequately, such as psychologic factors, meals, tobacco, bladder distension, exertion, pain due to inflation of the cuff.

The book begins with an excellent chapter on the history of the recording of blood pressure. Then a chapter on physiology of arterial pressure, one on clinical measurements of arterial pressure, factors that affect the arterial blood pressure, normal values of arterial blood pressure, and diagnostic applications of arterial pressure measurements. The book ends with a fine bibliography. Only one reference of importance is missing that of the Russian surgeon Korotkoff, who in 1905 described sounds heard over an artery immediately below the cuff and which are known as Korotkoff sounds.

This excellent monograph will stimulate thought, it will help rectify errors in measurement and interpretation, it will instill confidence, engender humility and respect for the problems involved in the clinical recording of arterial blood pressure. If proper habits, proper equipment and proper techniques are used routinely, it will be found that it is just as easy to record blood pressure accurately and reliably as it is to record it haphazardly and erroneously.

CURRENT THERAPY 1963. By Howard F. Conn, M.D., W. B. Saunders Co., Philadelphia, Pennsylvania, 1963, 775 pp. $12.50.

Reviewed by: LOUIS H. NAHUM

The book contains the latest approved methods of treatment for the practicing physician and this is made certain and secure by glancing over the names of the consulting editors. George E. Burch, M. Edward Davis, Vincent J. Derbes, Garfield G. Duncan, Hugh J. Jewett, Clarence S. Levingood, Perrin H. Long, H. Houston Merritt, Walter L. Palmer, Hobart A. Reimann, Ralph Wayne Rundles and Robert H. Williams.

There are 303 authors from all over the world who have written the precise trustworthy outlines of therapy for each disease or condition that the physician is most likely to encounter in practice. The recent advances are recorded along with long tested therapeutic agents so that the methods described actually represent the present day approach to the complete management of the patient. The practice of good medicine requires a sound and balanced point of view and this is well achieved in this volume.

This is a new edition not just a revision of the old one and its success in meeting the need is attested by the world-wide distribution of this excellent book on therapy. On the inside cover both front and back are given normal laboratory values of clinical importance, a most valuable addition and one that will be referred to over and over again by every physician, now that the use of the laboratory has become a foundation for good diagnosis and an indispensable check on some therapies.

It is doubtful if the average physician can practice the best medicine without having daily recourse to the pages of a book such as this excellent text.

SYNOPSIS OF NEUROLOGY. By Francis M. Forster, C. V. Mosby Co., St. Louis, Missouri, 1962, 223 pp. $6.75.

Reviewed by: LOUIS H. NAHUM

In this book will be found the methodologies that are used in making an evaluation of the neurologic patient. It successfully presents the most significant features of the disease entities in the field of clinical neurology, and of course since it is for students primarily, the greatest emphasis has been placed upon those disease entities that are most commonly encountered.

Neurology has been a very confusing field in part because of its dependence upon a good understanding of the physiology and anatomy of the nervous system. Also it is filled with minutiae and multiple eponyms. The author is aware of this complexity and has reduced eponyms to a minimum and then only as parentheticial names. However, the major disorders are emphasized and the rare occurring diseases interesting to the neurologist are set in reduced type.

The book is divided into two parts. Part one is devoted to evaluation of the neurologic patient, by history, neurologic examination, and clinical diagnostic tests. Part 2, is devoted to clinical neurologic entities such as vascular diseases, headache, epilepsy, diseases of the basal ganglia, multiple sclerosis,

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tumors, infections, trauma, metabolic and toxic disorders, diseases of muscles, degenerative and hereditary diseases of the central nervous system and finally, anomalies and defects of the nervous system.

Aside from being very valuable to the medical student, it is extremely valuable as a refresher to the family physician and all specialists outside of the field of neurology.

The author is Professor and Chairman of the Department of Neurology at the University of Wisconsin School of Medicine and author of a more extensive text. Those who are interested and need to know in great detail the nosologic entities and their treatment can refer to the author's textbook on this subject.

MANAGEMENT OF ANXIETY FOR THE GENERAL PRACTITIONER. Edited by Nathan Rickles, M.D., Charles C. Thomas, Publisher, Springfield, Illinois, 1963, 108 pp. $5.00.

Reviewed by: BEN BURSTEN

The widespread prevalence of anxiety among patients is a source of concern to every physician. The anxious patient is acutely uncomfortable and presents his doctor with a plea for help which can hardly be ignored. In addition, as Dr. Rickles points out, anxiety is contagious and the physician soon feels compelled to take some definitive steps to alleviate the situation. A sober and reflective discussion of the management of the various types of patients with anxiety would indeed be welcomed by the conscientious physician who is baffled by the problem. Unfortunately, this volume does not fulfill the promise of its title.

The book is a collection of essays based on papers presented at a "Symposium on Anxiety for General Practitioners." As such, it lacks an integrated approach to the problems presented by anxious patients. In a series of often mutually contradictory chapters, the reader is told about the physiology of anxiety, different methods of psychotherapy and the pharmaceutical approach. Such divisions might be useful to the researcher who is interested in testing and resolving contradictions; to the practitioner who seeks a way of understanding and handling a perplexing problem, the presentation can only add confusion. Thus, in one chapter expressive psychotherapy is suggested, while in another, re-education and relaxation exercises are recommended and "finding the cause" is discouraged. The clear inference from one essay is that phenothiazines are the treatment of choice for many patients with neurotic anxiety; in the essay which follows we read that only in rare instances should phenothiazines be used with neurotic patients. (This reviewer agrees with the latter view).

The essays taken individually are not generally helpful. Suggestions such as "More critical evaluation of procedures in managing . . . hospital admissions with a view toward reducing tensions" need amplification and illustration to be meaningful. Psychiatry has something to offer the practitioner who is confronted with the anxious patient in the hospital admitting room; indeed the management of anxiety should start well before the date of admission. However, the authors remain sufficiently vague that the knowledge which is available is often not conveyed to the reader.

Psychotherapy is described in such glowing, romantic terms that the reader is left unprepared to meet the inevitable resistances which a real patient presents. Dr. Rothman, in his chapter, alludes to "Psychotherapy and social therapy" but does not explain what he means by these terms or how these therapies should be integrated with the pharmacotherapy which he outlines.

The lists of psychotropic drugs suffer from carelessness. For example, no mention is made of the ataxia and drowsiness which are among the most frequent side effects of Librium.

By far the most informative chapter is Dr. Mirsky's essay on the physiology of anxiety. For the reader who seeks an encyclopedic overview of recent work in the neurophysiology and endocrinology of anxiety, this chapter is a good starting point.

The essays are written in a relaxed, at times folksy style which tends to become rambling and poorly organized. The papers give the impression of having been written hastily, and perhaps this haste and carelessness was communicated to the publisher, for there are also some serious typographical and grammatical errors which set this book apart from other Thomas publications. In general, the book does not offer much help to the clinician and is not scholarly enough to be of use to the researcher.

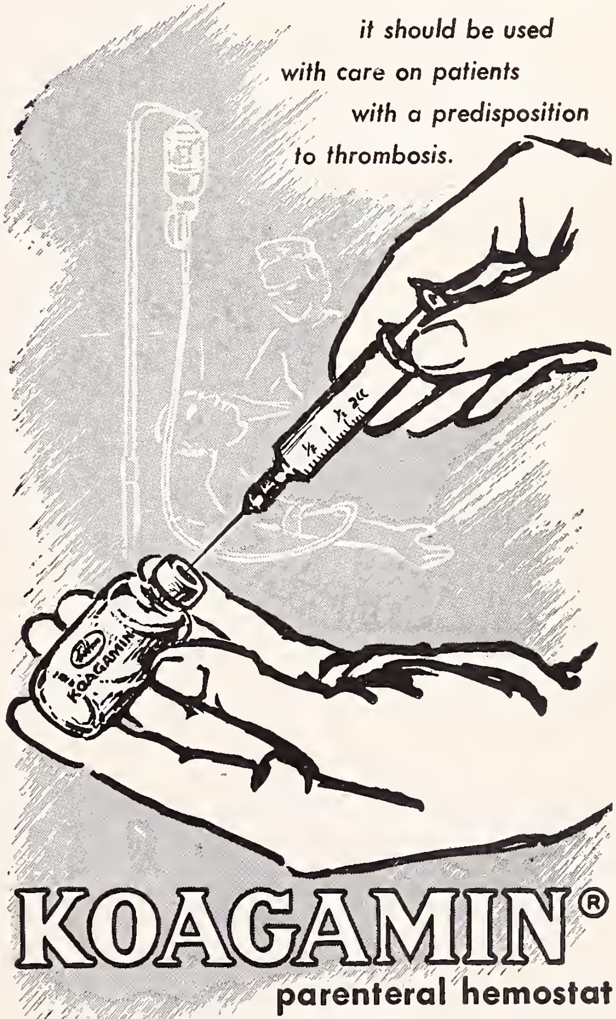
SAMUEL SEABURY: PRIEST AND PHYSICIAN BISHOP OF CONNECTICUT. By Herbert Thoms, M.D., The Shoestring Press, Inc., Archon Books, Hamden, Connecticut, 1963, 166 pp. $4.95.

Reviewed by: LOUIS H. NAHUM

Dr. Thoms has a way of rescuing important people from obscurity and bringing them to life again. In this book he sketches a character of a prominent Bishop, his trials and tribulations, resulting from finding himself on the wrong side in the American Revolutionary war. Apparently Bishop Seabury could not disassociate loyalty to the church from loyalty to the Crown and so he suffered grievously during the upheaval, lost his possessions, mode of livelihood and almost his life and made his living for a time by practicing medicine. It is clear that the latter was not even his second love for he left no descriptions of his cases in the form of reports and there is no way to glean from his letters just what medicine was like in this period of history.

Dr. Thoms as researcher and historian does give us a glimpse of what went on in practice in those days, but Bishop Seabury does not. Many of the remedies used in Seabury's day seem ridiculous to us such as opium, laudanum, belladonna, ipecac, quinine, mercury, cathartics and blood letting. Since cure of illness was thus left entirely to nature, it is the psychosomatic illnesses with which the wise physician had his greatest successes and this may explain why a minister with Seabury's authority could turn out to be a good doctor if he really was one.

The book is handsomely printed, thoroughly documented and reads along in an easy style. It should be treasured by churchmen, Yale's devotees, and students of good writing.



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Surgery And Drugs In Treatment Of Mammary Cancer

Despite the promotion of self-examination practices, efforts to educate women on the importance of periodic check-ups, and advances in surgery, the mortality has remained constant for many years, and about 25,000 women die each year in the United States from mammary cancer which either is inoperable or recurs and progresses following surgery.

Surgery and X-ray—In the effort to reduce mortality, various surgical procedures are used in mammary cancer, and each has its advocates; but some surgeons have questioned whether any one procedure has an advantage over others, and attribute differences in outcome more to intrinsic differences in patients and tumors than to the particular surgical method used. Most surgeons favor the Halsted radical mastectomy, with subsequent irradiation if lymph node metastases are found. Prophylactic irradiation of the axilla or breast area after surgery does not, however, improve survival rates and is not considered good practice in leading hospitals. Involvement of axillary nodes is probably the strongest single determinant of prognosis, apparently exceeding histological grade as such (J. Berkson, Acta Un. Int. Cancr., 18: 1003, 1962).

Hormone Control Measures — Various palliative measures are used in inoperable or recurring mammary cancer. Some mammary cancers are influenced by their hormonal environment, and, in premenopausal women, oophorectomy produces remission in about a third, the remissions lasting about nine months on the average. Treatment with androgens can be expected to result in remission in 20 to 25 per cent of cases, but androgens should be used only after oophorectomy or in postmenopausal women.

Doses of 100 mg. testosterone propionate are administered intramuscularly three times a week for at least three months, and then continued if the effects appear to be favorable. Such doses are always virilizing, producing hirsutism, acne, deepening of the voice, increase of libido and hypertrophy of the clitoris; some retention of fluid occasionally occurs.

Synthetic substitutes for testosterone have been used, among them dromostanolone propionate (Drolban—Lilly), a parental preparation which is considered to be about as effective as testosterone. perhaps with reduced virilizing effects. It is still too early, however, to be sure that it is not as virilizing as testosterone when used in equivalent doses. An oral testosterone analogue, fluoxymesterone (Halotestin—Upjohn; Ultandren—Ciba), appears to be as effective as testosterone, and with generally similar side effects. The liver damage sometimes caused by methyltestosterone has so far not been reported with fluoxymesterone.

Estrogens — Estrogens have paradoxical but important usefulness in women who are five years or more past menopause, producing remission in about 25 per cent of cases, whereas in younger women, estrogens may promote the growth of the cancer. The usual doses of oral estrogens are: stilbestrol, 5 mg. three times a day; or dienestrol, 10 mg. twice daily; or ethinylestradiol, 3 mg. daily. These large doses are likely to cause nausea and vomiting, at least at the outset, but they are usually better tolerated after a time. They are also likely to cause uterine bleeding and sodium retention.

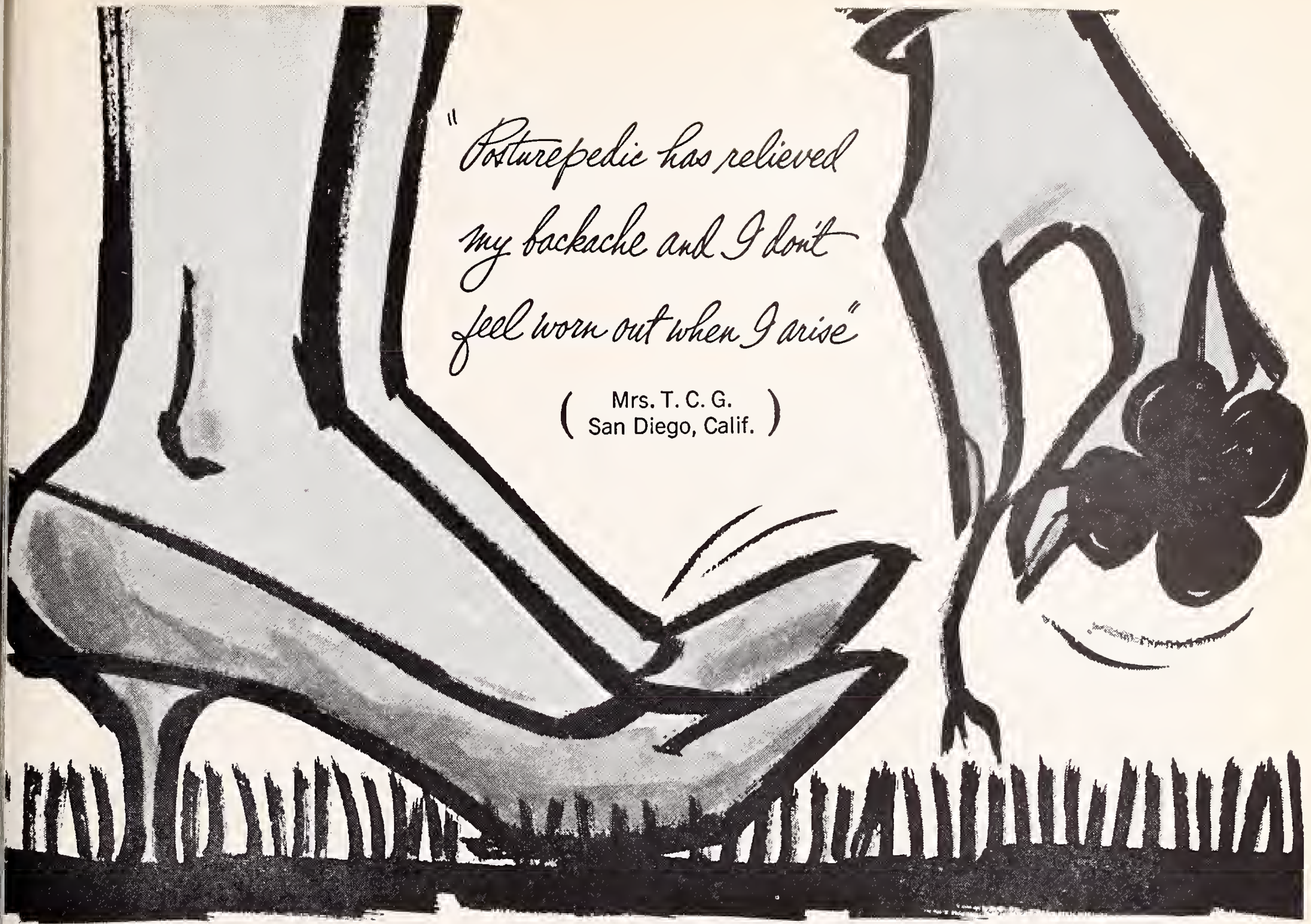
Both androgens and estrogens may on occasion stimulate destruction of bone by the cancer, with severe hypercalcemia. When osteolysis and hypercalcemia occur spontaneously, the calcium level can be lowered by administration of high doses of a corticosteroid. Hypercalcemia is most likely to occur in dehydrated patients.

Women who have previously responded to castration or to androgens may respond to adrenalectomy or hypophysectomy. Previously unresponsive patients are seldom benefited. Occasionally, the administration of corticosteroids in large doses can suppress adrenal function enough to produce a regression of advanced mammary cancer, although less than by adrenalectomy. Prednisone (10 to 30 mg. daily) or equivalent doses of other steroids can be given. Small doses are without benefit. Close supervision is required because of the severe metabolic, gastrointestinal, psychological, and other disturbances which usually attend prolonged corticosteroid therapy. Prophylactic use of corticosteroids at the time of diagnosis and operation is not warranted.

Chemotherapy—The nitrogen mustard or "alkylating" drugs and the antimetabolites are highly toxic substances with limited effect on mammary cancer. They are occasionally useful late in the disease, however, when the benefits of surgery, x-ray and hormone treatment have been exhausted (Medical Letter, 3:77, 102, 1961). When one of the alkylating drugs proves to be ineffective in a patient, others are also likely to be ineffective.

Drugs of the nitrogen mustard type include triethylenethiophosphoramide (Thio-TEPA—Lederle), chlorambucil (Leukeran — Burroughs Wellcome) and cyclophosphamide (Cytoxan—Mead Johnson). A study is being made of the systemic use of Thio-TEPA at the time of operation to reduce the frequency of recurrence, but the results are not yet known.

Reprinted from The Medical Letter on Drugs and Therapeutics, New York, N. Y., No. 20, September 27, 1963.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Drugs Which Lower The Blood Lipids

There is no reliable evidence that reducing the serum cholesterol or other lipids can slow the progress of atherosclerosis or improve the prognosis of the altherosclerotic patient. Since many clinicians and investigators do use drugs, however, their effectiveness and safety merit evaluation. (Dietary means of lowering blood lipids will be discussed in a later issue.)

Nicotinic Acid—Though its manner of action is unknown, nicotinic acid in doses of 3 to 6 gm. daily lowers the blood cholesterol in most patients, usually by more than 20 per cent. Skin xanthomata has disappeared in some patients, but no effect on atherosclerosis has been demonstrated. Flushing and itching of the skin are the most common side effects of nicotinic acid, and severe abdominal cramps often occur with the high doses used. Activation of peptic ulcer has also been reported. In an effort to control gastric side effects, nicotinic acid is combined with aluminum hydroxide in Nicalex (Walker). The amount of aluminum hydroxide in a Nicalex tablet is necessarily small, however, and whether the combination actually causes less gastric irritation than the relatively inexpensive nicotinic acid has not been established.

One case of bilateral amblyopia occurred in a patient taking 6 gm. of nicotinic acid daily for a year (J. L. Harris, Amer. J. Ophthal., 55:133, 1963), but it was reversed when the drug was discontinued. With prolonged use, liver function may occasionally be impaired to the extent of causing cholestatic jaundice, but it returns to normal when the drug is stopped. Some patients have developed mild diabetes, also reversible. Serum uric acid usually rises, but gout has not been noted. The hypotensive effects of ganglionic blocking drugs may be increased.

Sitosterols—Plant sterols, particularly the beta-sitosterols, interfere with the intestinal absorption of dietary or biliary cholesterol. Various studies indicate that sitosterols can lower blood cholesterol levels in some patients within a week or two and that the effect is not lost with prolonged use. Results have, however, been inconsistent, and in many patients, the changes observed as well within the range of spontaneous fluctuation in the serum cholesterol level. The manufacturer recommends one tablespoon (3 gm.) immediately before each meal of "medium size" and up to twice the dose with large or fatty meals. J. W. Farquhar, et al. (Circulation. 14:77, 1956) reported an average fall of cholesterol of 17 per cent in patients taking 12 to 18 gm. daily, and M. M. Best and C. H. Duncan (Ann. Intern. Med., 45:614, 1956) reported an average fall of 15 per cent on 18 to 25 gm. Poor results have been noted in patients with familial hypercholesterolemia and xanthomata. The chief side effects are abdominal cramps and diarrhea. No nutritional disturbances have yet been reported in man.

Other Cholesterol-Lowering Agents—Cholestyramine (Merck) (available for experimental use only) is an anion exchange resin which sequesters bile acids in the bowel, and has been reported to lower the serum cholesterol by an average of 20 per cent. Various thyroxine and triiodothyronine analogues have been used experimentally in the hope that they might have the cholesterol-lowering effect of thyroid without its calorigenic effect. Dextrothyroxine, which has had the most extensive trial, can lower serum cholesterol in many patients in doses of 4 to 8 mg. daily, but it tends to lose this effect after three months. Similar loss of effect with triiodothyropropionic acid has been observed. With all the analogues, doses which reduce the serum cholesterol will often aggravate or precipitate angina in patients with coronary disease.

Striking cholesterol-lowering effects of the thyroid analogues reported in patients with hypothyroidism are of no significance for patients with normal thyroid function, in whom hypercholesterolemia is due to genetic and other causes. Estrogens can lower the beta-lipoprotein fraction of serum cholesterol, but there is no satisfactory evidence that they can favorably influence the course of atherosclerosis. In men, doses which lower cholesterol significantly are generally feminizing.

Triclycerides — Some investigators believe that serum triglyceride levels are more important than cholesterol levels. Sitosterols and the thyroid analogues do not lower blood triglycerides. Nicotinic acid has been reported in some studies to do so, but not in others. Parenteral administration of heparin reduces the triglyceride content of blood transiently, and only in relatively few patients. Even less benefit can be expected from Clarin (Leeming) heparin tablets, which are used sublingually.

Ethyl chlorophenoxyisobutyrate (clofibrate) with androsterone is offered in England as Atromid (Imperial Chem. Ind.) and is reported to lower both serum triglycerides and cholesterol to near normal in many cases. The drug is not marketed in the United States, and more information is needed about its effectiveness and safely (agranulocytosis and disturbance in liver function have been reported).

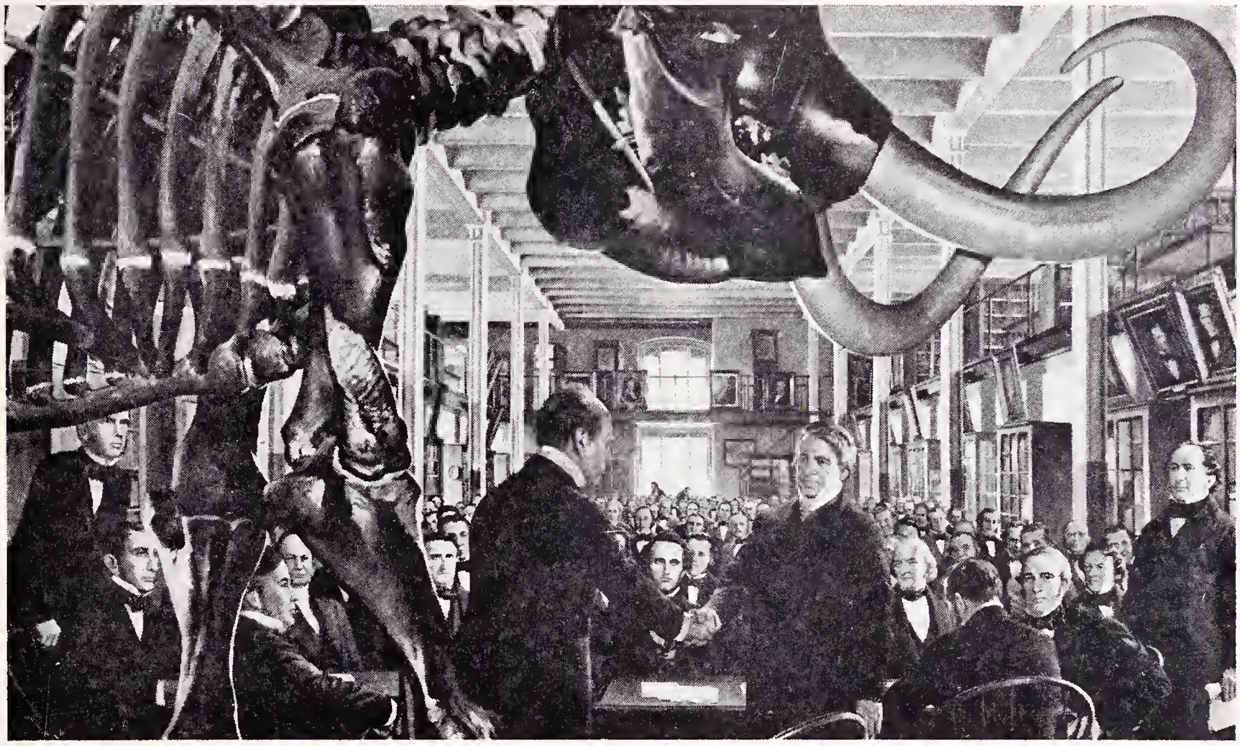
Reprinted from The Medical Letter on Drugs and Therapeutics, New York, N. Y., Vol. 5, No. 21, October 11, 1963.

Connecticut Medicine

Connecticut State Medical Journal

Volume 27 / December 1963 / Number 12

PHYSICAL FITNESS: DENIS S. O'CONNOR, M.D., GUEST EDITOR



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Connecticut Medicine

editorials

Medical Leadership In Public Activities

The revolutionary advances in communications n recent years, by making much medical knowledge available to the general public, has radically changed the attitude of people in general toward the medical profession.

Not only has the printed word increased its scope and distribution but radio, motion pictures and television have done much to bring hitherto technical medical information to the public.

The treatment advances in medicine, requiring many types of para-medical aides, have also served to diffuse medical knowledge and to dilute the influence of the medical profession.

This decreasing influence of the medical profession on public medical questions raises the question of the profession's appreciation of this change and whether organized medicine is prepared to meet it.

A look at the organization of the medical profession and some factors which have weakened its force could help us to understand why this is so.

Medical organization goes back to the earliest days of our history. Medicine was one of the learned professions and it was not uncommon for a clergyman and a college president to also be a doctor. Under such high auspices, therefore, it is not surprising that the purposes of organization should be the promotion of public health, the education of the medical profession and the protection of the public from unqualified practitioners. These purposes have continued to be the purposes behind most medical organizations of later years. In pursuance of these high ideals, the medical profession has bound itself by a rigid code of ethics based upon the "Hippocratic Oath."

In the early days of this country few communities were medically populous enough to support an organization within themselves and the county became the basic unit of organization. County organizations combined to form a state organization and the states joined to form the American Medical Association, the national body. As our cities became larger and the number of doctors in our cities increased their numbers made it possible to form local societies. Unfortunately, the local societies did not become elements of the national organization but rather independent literary and social groups. They did serve the purpose of bringing to their members some of the advances in medicine at a time when medical publications were few and facilities for getting to medical centers were not so easily available.

It is this lack of integration of the local medical groups into the county, state and national bodies that constitutes a serious weakness in medicine's political strength.

Along with the communication factors which have put organized medicine at a disadvantage at the present time are the medical therapeutic advances coming from research, the development of the nation-wide, and even international pharmaceutical companies, which have largely replaced the local pharmaceutical chemist and the rapid rise in influence of the hospital in the medical field.

Since the large pharmaceutical companies until recently were the principal research centers in the development of therapeutic entities it was natural that competition for the favor of the practicing physician would be intense and would lead to all the measures of publicity which could be devised by the public relations industry and as might be expected the various methods of promotion became a source of post-graduate education.

THE COVER

THE AMERICAN MEDICAL ASSOCIATION

Advancement of medical knowledge, improved medical education, launching of a program of medical ethics, and furtherance of public service—these were aims of The American Medical Association, organized May 7, 1847, by 250 delegates seated among exhibit cases and before ancient bones of a mastodon, *Mammut americanum,* in the hall of The Academy of Natural Sciences of Philadelphia, Pennsylvania. Chairman Jonathan Knight welcomed Dr. Nathaniel Chapman, first president, and officers (foreground) as, after years of "pains, jealousies, and love," they launched what became one of the world's larger and greater medical bodies, now in its second century of service both to the public and to the profession.

The technical methods of diagnosis and treatment requiring highly specialized laboratories and expensive therapeutic modalities were responsible in part for taking the treatment of disease out of the home and into the hospital.

This movement was sharply augmented by the formation of prepaid hospital and medical insurance.

With improvement in hospital standards by the activities of national accreditation bodies pressure on the medical staff to conform to hospital rules made compulsory attendance at staff meetings at which medical subjects were presented and hospital care and doctor proficiency analyzed, obligatory.

The expansion in the number of medical publications, many of which are distributed throughout the country without cost added to the educational facilities available to the doctors. It was inevitable that with the limited time and energy available a doctor would have to choose his sources of education.

Since the hospital is a vital need to the practice of medicine the compulsory attendance at staff meetings with their planned lectures and medical audit became the primary source of education, and attendance at local medical society meetings, as well as county and state meetings decreased. Even the interest in national meetings was largely for the purpose of enjoying a holiday in the company of congenial associates.

These developments have led to a weakening of the basic organization of medicine for which a solution must be found if organized medicine is to provide the leadership in public affairs of a medical nature.

One does not have to look far afield to see the leadership in medical affairs being exercised by those organized groups of little, or no medical knowledge, but of a great political strength.

Even the individual of no particular intellectual training but of sufficient political power to win office by election or appointment is accorded preferred space by our press to expound his ideas on medical subjects and with his political power he may be able to put his ideas into effect.

It should be obvious that today the county is not the "grass roots" level of organization, especially in medicine. If organized medicine is to serve its high purposes its organization must be brought down not only to the community level but to the hospital staff level.

The present physical fitness program is a good example of midplaced leadership. As Dr. Hanley states in his article in this issue of Connecticut Medicine, physical fitness is not a single and universal entity. The fitness should be for a purpose. The highly trained athlete may be fit for the activity in which he is engaged but that activity is usually of passing moment and his highly trained physique is of little value for his everyday activities. The military draftee may have a defect which unfits him for military duty but he could be exceptionally fit for the activities of daily living.

If we are to have co-ordination of the physical training of our youth for fitness in adult life, organized medicine must depart from its ghetto-life existence and move into the main stream of public life to assume the leadership in medical affairs at all levels of government.

Denis S. O'Connor, M.D., Guest Editor

New Kidney For Old

Previously, we thought of the benefits of our immune mechanisms, and sought means to utilize them and improve upon them in order to help us survive infections. Now we are in an era where we also need to know how to suppress these mechanisms for only in this way can successful organ transplantation be accomplished. The problems are many but happily are becoming soluble. When skin or kidney or heart is transplanted from one animal to another, it is promptly rejected by the recipient, except in the instance of identical twins where the donor and recipient are antigenically similar. It is also possible that histochemical compatibility can exist in separate individuals but methods to determine this are not yet sufficiently developed. If successful organ transplantation is to become a feasible technique, then methods must be developed to establish tolerance by the recipient for donor tissues and organs that are histochemically incompatible.

At the present time there are already a large number of techniques for modifying the immune response to a homograft. In an animal, tolerance to skin grafts may be produced by intravenous or intraperitoneal injections of soluble extract of donor antigen.[1] Likewise an extract of thymus alpha-l-glycoprotein, if injected at proper intervals following transplantation, can prolong the life of homografts of rat skin.[2] Other methods like thymectomy, splenectomy, subtotal x-irradiation, radiomimetic drugs and local x-irradiation of the kidney have all been used in the human. With all these techniques, however, success is achieved more easily, if there is a close antigenic relationship between donor and recipient as exists in identical twins and as must exist radomly amongst individuals in populations. This kind of a relationship does exist in inbred mouse strains where it can easily be quantitated. In the human it is much more difficult, but such a biological test does exist.

Merrill et al in a recent case, reported the successful transplantation of kidney from a human cadaver.[3] This case is alive and has returned to work although his renal function is subnormal and he requires transfusions for chronic anemia. This and other reports documenting survival of kidneys transplanted between non-siblings and unrelated donors and recipients, illustrate successful application of the various techniques to facilitate tolerance to kidney homografts by immune suppressive measures. There are now two human recipients in whom a kidney from an unrelated donor has survived for well over a year. The first successful kidney homograft between individuals other than identical twins was performed in 1960 at the Peter Bent Brigham Hospital and a similar case occurred in France six months later. Both recipients are alive and well today. At this time it was recognized that one could at least produce partial tolerance to a renal homograft, by the use of immunosuppressive agents. It was also recognized that rejection of the homograft after a period of time may be prevented by subsequent doses of the same or other immunosuppressive agents. These two concepts: that one can by immunosuppressive agents produce temporary tolerance, and that this can be re-inforced by subsequent similar treatment were both practiced by Merrill et al in his case. Several episodes of rejection were each aborted by the use of actinomycin C or prednisone and the renal homograft is sustaining life after fifteen months of the transplantation.

The authors recognize that patients maintained on chronic immunosuppressive therapy are undoubtedly more susceptible to bacterial infection, but with antibiotics Merrill's case survived an attack of pneumonitis. They also recognize that the drugs used in suppression such as azothioprine can have a direct toxic effect on the kidney by interfering with the tubular transpart mechanism as well as damaging the hematopoietic system to produce anemia which plagued this case.

Merrill and his collaborators approach to the problem of organ transplantation is a model of clinical investigation. In their second case they grafted a piece of skin from the donor to the recipient.[4] They found it remained twenty-three days, an evidence that the antigenic difference between donor and recipient was not great. But the differences were definite since a second graft between recipient and donor was rejected in characteristic and accelerated fashion. Accordingly, sublethal whole body irradiation was utilized in an attempt to produce tolerance. After the recipient recovered from the effects of X-irradiation and surgery the renal homograft was apparently well tolerated until some six months post-operative when evidence of rejection of the homograft appeared and became compelling enough to require treatment with small doses of whole body irradiation and large doses of corticosteroids three months later. Gradually evidences of rejection cleared.

X-irradiation and immuna suppressive therapy undoubtedly interfere also with the metabolism and reproduction of other cells besides the ones that participate in the immune response. If "tissue typing" were made possible then proper donor-recipient selection would make it possible to select totally compatible donors or ones whose organs would be "accepted" with the smallest possible doses of immunosuppressive agents. Although the prolonged survival of this kidney from a cadaver is encouraging, it does not signify a specific and universal approach to the solution of the problem. Ideally the selection of a potential donor whose tissue antigens closely match those of the potential recipient offers a method of minimizing the amount and possibly the duration of immunosuppressive therapy.

This means that the donor is more likely to be alive, not a cadaver and this would at once raise moral and legal questions. But life with a single kidney is not so hazardous, and where there is a reasonable chance of more than five year survival for the prospective recipient, it is not difficult to see that the donation of one of two normal kidneys to one dying of renal failure would be recognized as justified and many donors would be found and willing.

Merrill et al emphasize in their report that nothing they have done so far represents a true "break-through" in the field of kidney transplantation. But who can fail to recognize that their reported experiences offer exciting and promising prospects for the future. As true scientists they end with an understatement of their achievement "the continued well-being of the patient suggest that continuing effort in this field are warranted."

L.H.N.

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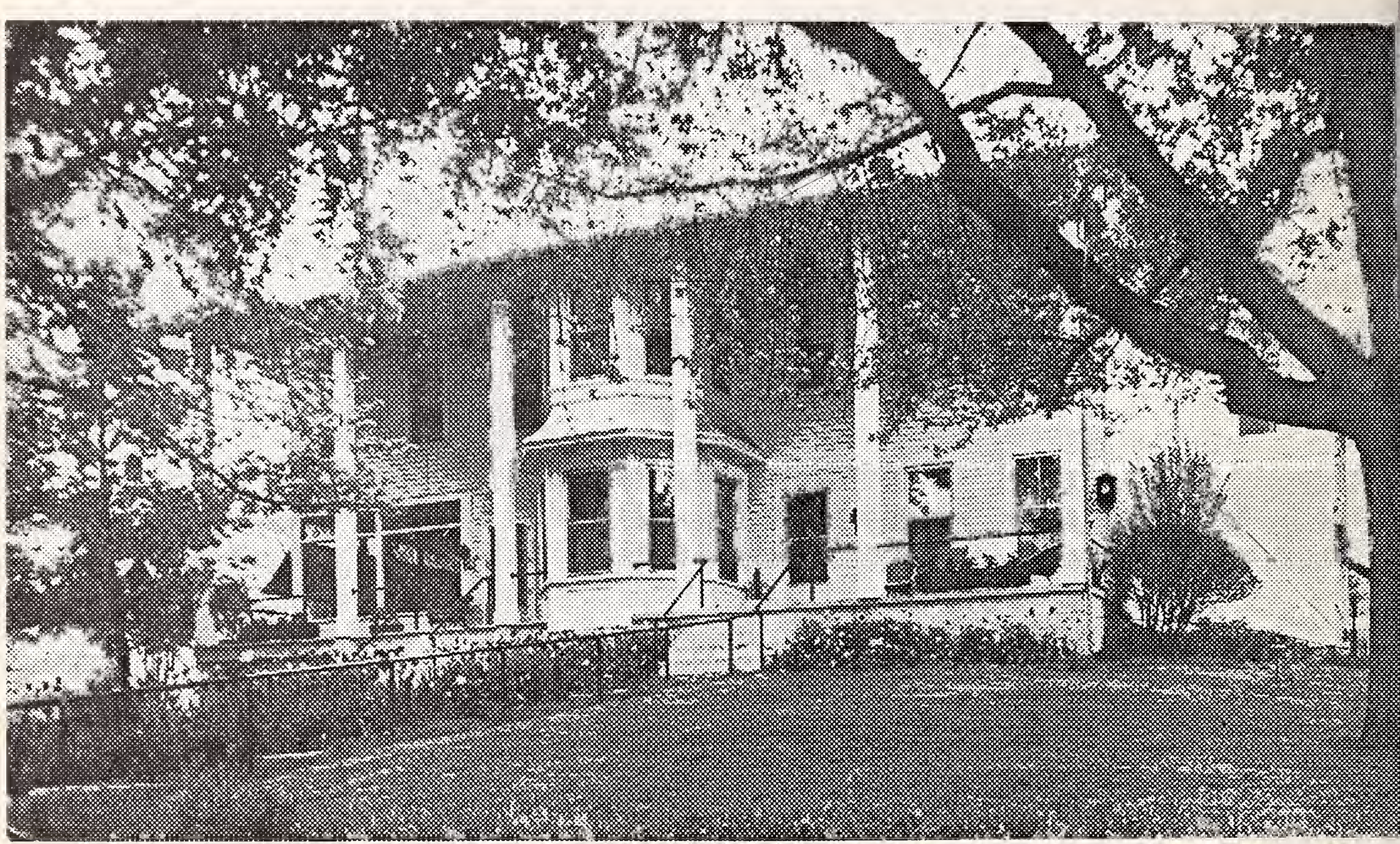

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Collection Of Blood Samples

If blood samples are to be truly representative of venous blood for the body as a whole, some thought must be given to the minutiae of collection. Almost every venipuncture is preceded by application of a tourniquet above the elbow and mild exercise of the hand. The tourniquet is applied at a pressure above the venous pressure and below the arterial diastolic pressure. When a large vein becomes visible or palpable a needle is introduced into it.

What next? Should the tourniquet be removed to "avoid stasis?" or should the tourniquet be left in place and the sample withdrawn? Logically, one would expect blood trapped in a large vein to undergo no more change than blood filling a closed test tube. Furthermore if the tourniquet is released before the sample is taken, one would expect altered values when metabolites from the capillaries suddenly escape into the venous blood.

In a recent authoritative study Mull and Murphy[1] have shown that there is *no* effect of a tourniquet applied at the usual pressure plus light exercise of the hand for periods up to 10 minutes as far as the following blood constituents are concerned:

Hemoglobin
Hematocrit
Leukocyte count
Erythrocyte count
Prothrombin time
Sodium
Potassium
Chloride
Carbon dioxide
pH
Glucose
Urea nitrogen
Creatinine
Cholesterol
Total Protein
Lipids
SGOT
LDH
Alkaline Phosphatase

This should put to rest fears of incorrect sampling due to "stasis."

Another very real sampling problem is that of fasting before blood drawing. Except for blood sugar, values for the constituents usually studied are not particularly affected by eating.[2] Nevertheless most hospital laboratories must still insist on drawing routine blood samples before the patient has breakfast. This is the only practical solution to a series of problems involving patients (fainting and vomiting after venipuncture), mass production routines in the laboratory, and Quality control of groups of specimens. However if an exception is necessary the analytic values obtained will ordinarily be the same on non-fasting as on fasting blood specimens.

R.N.B.

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The Obsolete Menopause

A girl becomes a woman when estrogen and progesterone arrive. When they depart, she is a woman by courtesy only—in reality a castrate, condemned by tradition and a mystique that surrounds this time of her life in an almost impenetrable cloak.

The favorable metabolic effects of estrogen and progesterone on every body cell are not fully realized. Estrogen improves cell permeability and regulates the supply of micronutrients, enzymes, glucose, minerals, water, etc.[1] Progesterone, while essentially catabolic, is definitely needed for balanced cell metabolism. Both are essential for homeostasis.

In the past, because the menopause happened to every woman it was generally thought to be normal. As long as there was no remedy this was a comforting, almost necessary idea. Today the effects of estrogen and progesterone deficiency are so completely documented that to list them would be repetitious. We know that menopausal women are not normal; they suffer from a deficiency disease with serious sequelae and need treatment.

The removal of the ovaries and uterus in women in the twenties and thirties is sometimes necessary and denying them *full* hormonal replacement is the rule rather than the exception—a form of "medical barbarism." This is also true when the denial is in the forties or fifties, and even later. Although the insult decreases with age, every cell is adversely affected. If there is to be denial—a cut-off point—at what age is it to be? Who is to decide this? On what research is it to be based?

When the thyroid weakens with age, replacement therapy, continued indefinitely, causes no concern; this applies to the pancreas and adrenals too. But when the gonads fail at the menopause a different philosophy prevails—"Don't interfere with nature."

Precise diagnosis and treatment is the rule when ovarian failure occurs in the twenties or early thirties, yet after about age 35 this is seldom the case. Failure is attributed to early menopause and there is a loss of therapeutic interest. The patient is told to expect amelioration and preparation for future adjustment, but not cure.

About ten per cent of women maintain a high estrogen titer as late as age 60. One of these visits her gynecologist. After examination plus an analysis of the vaginal smear, he compliments her on her perfect condition—her high estrogenicity. A few days later he is visited by her twin sister with atrophic breasts, senile vaginitis and many bizarre symptoms of the menopause. Finding a low cornification index, he reluctantly prescribes estrogen in low dosage and a tranquillizer "to tide her over this trying time." She immediately challenges him, "Logically, Doctor, my estrogen level must be elevated to that of my sister or you must reduce her level to mine. You cannot have it both ways."

Replacement therapy with both hormones presents few problems when the ovaries have been removed accompanied by hysterectomy. If the ovaries are removed or functionally dead but the uterus intact, cyclic replacement therapy will result in withdrawal bleeding. This cannot be dispensed with because of the systemic metabolic effects of progesterone in addition to its needed target action on the perilobular and alveolar tissues of the breasts. This bleeding prevents endometrial hyperplasia. Endometrial cancer may be inhibited, or even cured, by progesterone and its derivatives.[2] Early in-situ endometrial cancer is surely restricted from further invasion by the wholesale destruction of surrounding tissue and its subsequent lavage by rhythmic bleeding.

If steroid hormones remained in their glands of origin they would be useless to body economy. Target or any other cells do not care where their estrogen and progesterone originate. Fundamentally the gonads are pharmaceutical laboratories; when the ovaries close up shop, the soma is quite content to receive its steroids from the corner pharmacy.

The percentage of superficial cells in the Papanicolaou smear is a valuable tool in estimating estrogen deficiency—"treat the smear."[3]

The ingestion of a tablet daily represents the essential difference between a life partly lived or a full one—a body and mind of multiple divisions or homeostasis, the complete woman. Over a hundred years ago, a French gynecologist graphically described post-menopausal women . . . "Compelled to yield to the power of time, women now cease to exist for the species, and henceforward live only for themselves. Their features are stamped with the impress of futility." One of our best known and loved professors recently said, "Something must be done for these poor women." The menopause became as obsolete as the bow and arrow the day potent oral progestogens were born.

Robert A. Wilson, M.D.

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Science Tools: 3. The Cyclotron And Its Atomic Knife

In the early days of the modern nuclear era, it became necessary to learn the biologic effects of neutron rays, in order to be able to predict damage to workers and thus be enabled to set safety standards. These neutral heavy particles are approximately 2,000 times as heavy as electrons and were found to have biologic effects several times greater than an equal dose of X-rays. There appeared also some indication from the studies of neutron rays that they had a more favorable differential effect over X-rays on tumor tissue as compared to normal tissue. For therapeutic purposes, X-rays required higher dosage, exhibited more scatter, and therefore were prone to damage also structures adjacent to the target area.

In 1945, when heavy particles with higher energies became available as increasingly larger accelerators were developed, cross-firing beams were used to permit higher concentration at zones of intersection. At the end of the range of the beam, particles stopping, give off additional energy (Bragg effect). These end of range particles are more effective than particles further up stream in producing radiation change in many biologic systems, mitosing cells, such as those of tumors, being especially sensitive. With the added properties of greater penetrations and little scatter it is possible to produce localized lesions in the tissues of the nervous system with little damage to cranial nerves, temporal lobes or hypothalamus.

These high energy protons and alpha particles have now been used in various forms of so-called bloodless surgery or radiosurgery. This has led to their use in the direct treatment of tumors and the suppression or ablation of functions of the pituitary gland in such conditions as advanced breast cancer, diabetic retinopathy, malignant exophthalmus and acromegaly. They have also been used in the production of lesions in the thalamus in the treatment of Parkinson's disease.

Recently the Donner group[1] have reported two cases of Cushing's disease which were not relieved by adrenalectomy, but were, by the use of the "atomic knife" on the pituitary. The authors point out that the use of conventional X-ray or gamma rays have been limited by the dose (2,000 to 3,000 r) that can safely be delivered to the sella turcica. Because of the relatively great scatter and low biological effectiveness doses of adequate depth cannot be attained with these radiations without at

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* AMA Council on Foods and Nutrition: The Regulation of Dietary Fat, *JAMA* 181:411-423 (August 4, 1962).
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the same time endangering the surrounding cranial nerves, hypothalamus and temporal lobes. Heavy particles, however, have the advantageous properties mentioned above and offer a method of suppressing pituitary function, alleviating the symptoms and signs of Cushing's disease. The authors in the cases reported, describe and discuss the use of 900 mev alpha particles for this purpose, and reveal the imposing successes by means of alpha particle beams.

The problems which the authors faced in deciding upon the use of the "atomic knife" on the pituitary gland of patients with Cushings disease were several. First of all was the need to be satisfied that in Cushing's disease, the real fault lay in the pituitary gland, as Cushing originally proposed, and not in the adrenal glands, an idea that subsequently developed. In this, they were assisted by recent studies on pituitary adrenal function[2] and also by more frequent recognition of pituitary tumors in patients with Cushing's disease. Furthermore, success in treating Cushing's disease had already been achieved by hypophysectomy as well as by implantation of radioactive sources such as Y90 or Au 198. However, surgery also carries with it certain risks and side effects such as dangers of anesthesia, surgical stress and the risk of sepsis. If one could inhibit anterior pituitary function by an extrinsically delivered energy source, this would of course, be the most suitable form of therapy. And so they turned to the cyclotron which can impart heavy particles such as protons and alpha particles at extremely high energies, and deliver them specifically to the sella turcica in desired amounts.

Case one described by the authors received 8500 rad of alpha particles delivered to the pituitary in six treatments. The patients remission has now lasted three years. Her menses have resumed, the basal steroid excretion is normal and she remains clinically euthyroid. In case two, there was already surgical ablation of bilateral adrenal hyperplasia, but a pituitary tumor enlarged. Only by the use of the "atomic knife" to the pituitary gland was she cured.

The successful treatment of these cases by the "atomic knife" has several important therapeutic implications. With the use of heavy particles such as alpha particles and protons one can teletherapeutically deliver larger doses of ionizing radiation than can be administered by X-ray or gamma ray sources. This radiation can be accurately localized to the pituitary and delivered with little scatter thus reducing the danger to surrounding C.N.S. structures. The dosage thus delivered to a desired depth only, is several times greater than the surface, but also the effect per unit of dose is greater, owing to the unique property of these penetrating particles referred to as the Bragg effect.

The "atomic knife" is another example of the enormous dependence of modern science upon the ingenuity of instrument makers. The electron microscope has made routinely available to the biologist, pictures of incredibly small viruses. The astronomers detect and analyze light and radio waves originating in stars billions of light years away. Physicists and engineers can measure and study phenomena taking place in a billionth of a second. Now the cyclotron and other accelerators capable of delivering heavy particles teletharapeutically to the pituitary without damage to the surface or the surrounding structures has become an important tool for investigational as well therapeutic studies.

L.H.N.

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—Oliver Wendell Holmes,
The Stethoscope Song

In a radiology department of one of the best hospitals in the world, a stethoscope hangs on the wall and below it is written "Rare and unusually well preserved fragments known as the 'Stethoscope' (binaural type circa 1918) formerly in common use in the diagnosis of pulmonary and cardiac disease. The contraption was developed by Laennec early in the 19th century and was actually in general use until the roentgen era."[1] This grandiose obituary of the stethoscope is hardly justified. In fact, the stethoscope is used more widely than ever before. Thoracic, cardiac, and surgeons generally are rarely ever seen without it. Laryngologists use it to determine which vocal chord is paralyzed; rhinologists to screen for hydrops of the maxillary sinuses. In fact, auscultation of arteries, apart from those close to the heart, and those involved by arteriovenous aneurysms, has never been widely practiced and promises to become more and more popular, because valuable information may be obtained by this simple means. When taken in conjunction with other information obtained by a full clinical examination, exploration of the peripheral arteries with a stethoscope can often enable the clinician to make an accurate diagnosis. In many patients, this simple test may permit the omission of arteriography, a procedure not without risk, which is also both expensive and time consuming.

In screening a population for heart disease, the stethoscope is still the most useful instrument. Useful as are chest X-rays and electrocardiograms, these do not give as high a take. The findings in patients with arterial aneurysms, arteriovenous fistula and coarctation of the aorta are well known. Continuous bruits with systolic accentuations are characteristic of arteriovenous fistula of traumatic origin and they are usually harsh with many low frequency components. If the fistula is located near the surface of the body, there is usually also a palpable thrill. If the artery leading to the fistula is located where it can be compressed, then its compression will result in the immediate disappearance of the bruit. Partial compression of the proximal artery can change the continuous bruit into a systolic one, because this maneuver allows the pressure in the artery and vein joined to it, to equalize during diastole.

The auscultatory findings in patients with atherosclerosis, however, have thus far received much less attention. Some of these arteries are on the surface such as the subclavians, carotids, vertebrals and femorals. Others are deeper, such as the splenic, renal, mesenteric, and iliac arteries. Here a high degree of selective attention is required to gain the maximum information from auscultation. In all of these vessels, both superficial and deep, arterial stenosis of sufficient severity to cause symptoms, will produce a systolic murmur in at least a quarter of the patients. Occasionally a systolic murmur will extend into the first part of diastole and may be due to the development of an unusually efficient collateral circulation around a complete arterial occlusion. These findings are frequent over the intercostal arteries in coarctation of the aorta. Occasionally such a systolic murmur previously detected disappears. This is important evidence that the artery which was previously stenosed is now occluded by thrombus. Clearly the diagnosis of atherosclerotic disease at the stage of arterial stenosis, as opposed to complete arterial thrombosis, is becoming increasingly important. This is particularly so in the case of the carotid, vertebral, mesenteric, renal arteries and the bessels of the limbs, because of the high degree of development of our techniques of vascular repair.

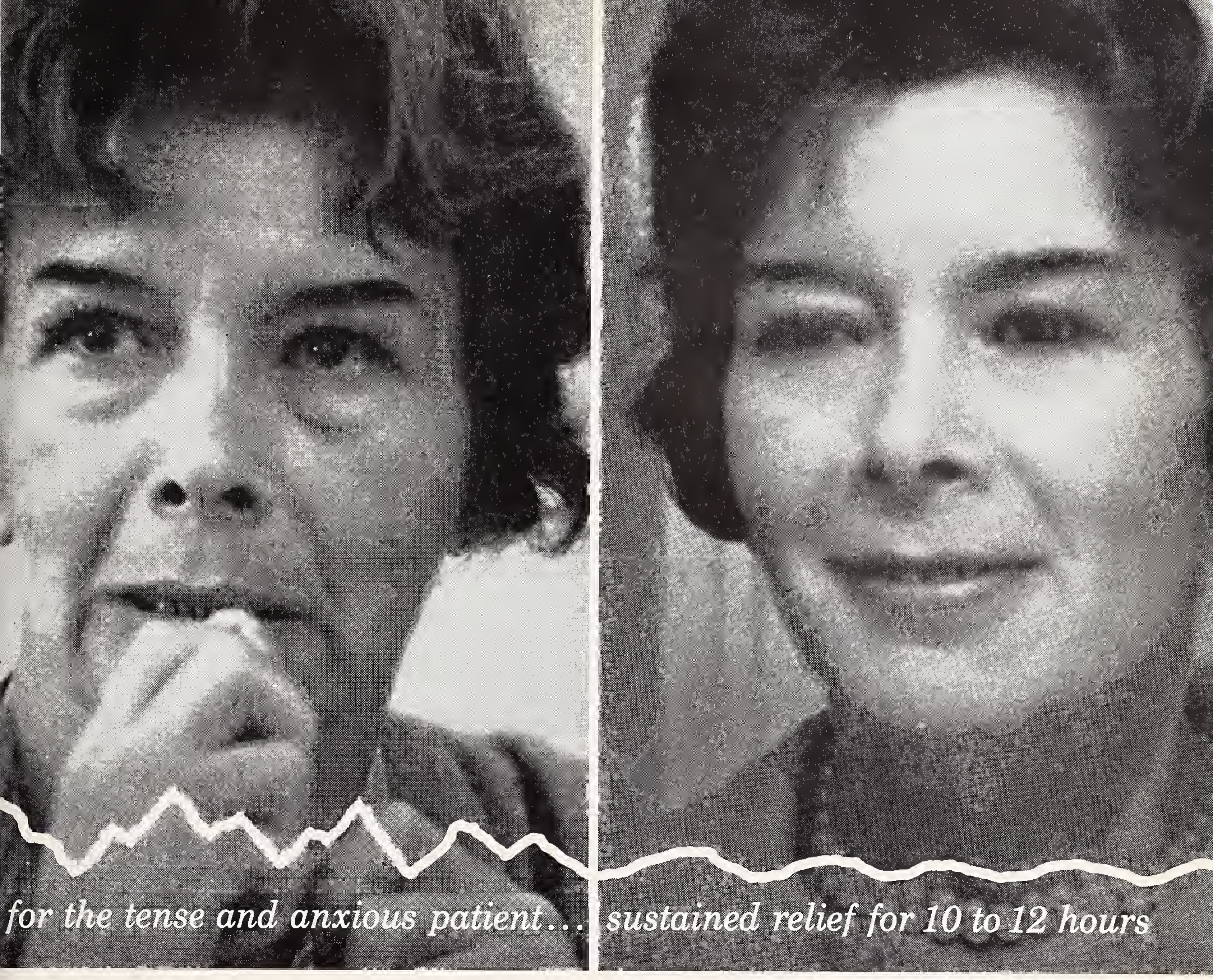
The importance of arterial auscultation of the carotid and vertebral arteries is, that stenosis may produce clinical effects which are indistinguishable from those caused by a complete thrombosis of this artery. The presence of a murmur heard over the bifurcation of the carotid artery in the neck, means that the occlusion is only partial. A similar murmur heard at the base of the neck has been shown to be due to stenosis at the origin of the vertebral artery. Such murmurs may be heard in certain patients without any clinical abnormalities if the stenosis has not as yet progressed to the point of causing symptoms. It is a telltale sign of things to come.

Among the deep arteries, auscultation is of special value over the renal artery. Stenosis of this artery is a cause of arterial hypertension and often produces a systolic murmur which can best be heard by pressing a diaphragm stethoscope firmly against the abdominal wall one to two inches above and one inch to either side of the umbilicus. The bell should be brought as near the renal artery as possible because the audible sound produced by the stenosis may not be transmitted at too great a distance. While murmurs may arise in other arteries deep in the epigastrium, the murmur of renal artery stenosis has been observed to disappear after thrombosis or in reconstruction of the renal artery, thus proving its point of orgin. The great value of this murmur is in screening patients with unexplained hypertension, since in such patients the possibility of stenosis of the renal artery as a cause of the hypertension must always be considered.

Auscultation along the course of the abdominal aorta and internal iliacs and proximal femoral artery is also a useful investigation. A systolic murmur indicates the exact site of an area of arterial stenosis. In many patients with arterial disease of the limbs, no murmur will be heard because a complete arterial occlusion is present, However, in some patients with unilateral symptoms, auscultation of arteries in the sound limb will reveal a systolic murmur which may indicate an arterial stenosis, a possible site for a thrombus at some future date.

In the upper limb, the greatest use for arterial auscultation is in patients with the aortic arch syndrome and cervical ribs or the thoracic outlet syndrome. Here a systolic murmur over the subclavian artery is a common finding, not only when a fusiform aneurysm has formed, but before this, when the artery is still normal on palpation. At this stage the systolic murmur indicates roughness and irregularities on the wall of the artery usually associated with some mural thrombosis. To be sure one can produce a systolic murmur over the subclavian artery in the root of the neck merely by heavily applying the stethoscope, but this is a technical pitfall easily avoided.

Auscultation is of value also both during and after surgical operations. During an operation, the stethoscope may be a "useful aid" in the difficult task of accurately locating an arteriovenous fistula or in the case of visceral arteries, the exact point of an arterial stenosis. This is of special value in locating the exact point of stenosis of a renal or mesenteric artery. In the postoperative period after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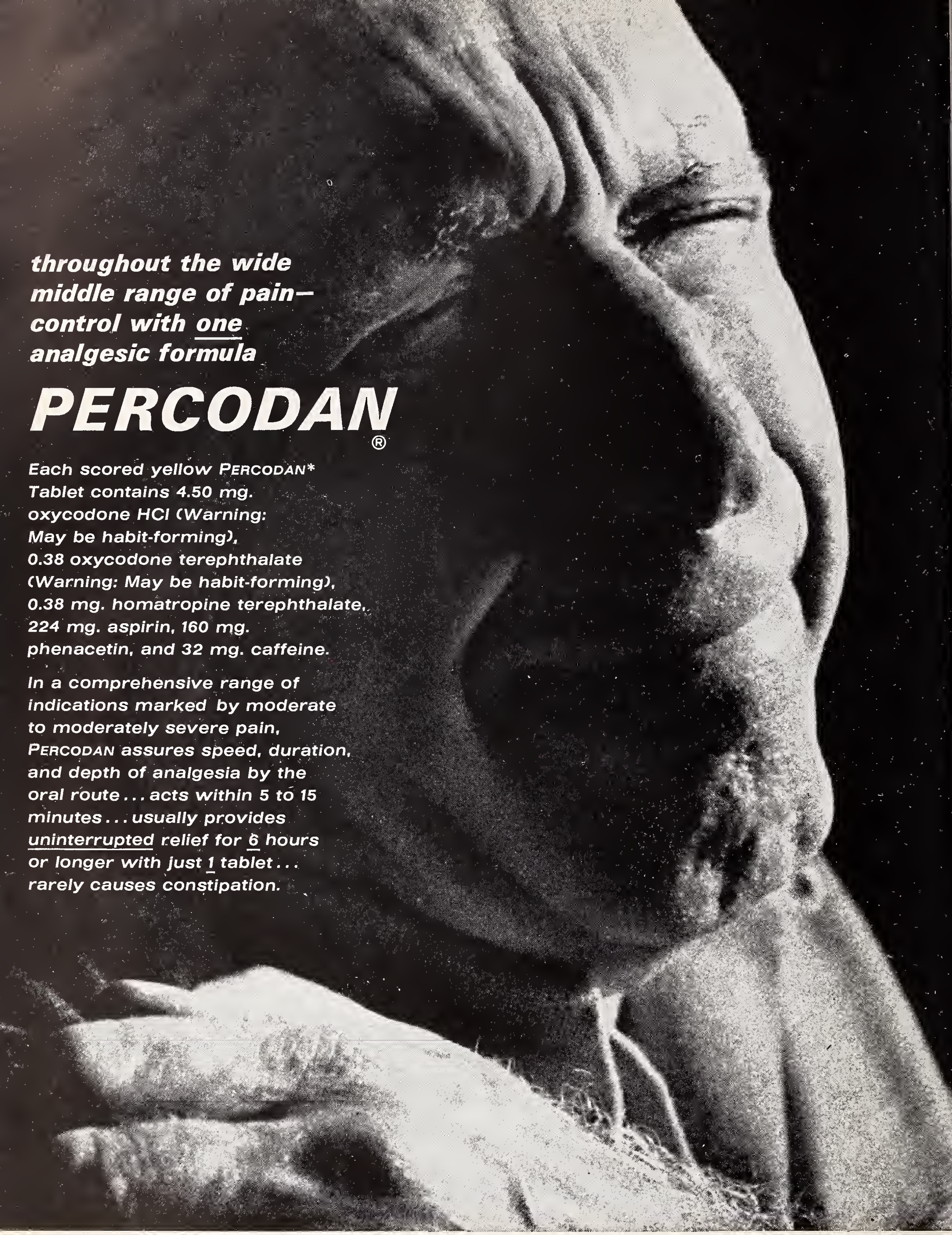

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an arterial reconstruction operation, the artery should be silent. If, however, there is a stenosis at the site of an anastomosis or a kink in the arterial graft, a murmur will be produced and will strongly indicate that this artery is likely to thrombose eventually.

Enough has already been said to indicate that probably no area of the body can be excluded as a possible bruit area. All of the body surface from the top of the head to the bottom of the feet whereever there are arteries one must prospect for abnormal sounds indicative of arterial stenosis or arteriovenous communications. Radiologists may disdain the stethoscope, but prospecting with it by the clinician, can bring only good to him and the patient.

L.H.N.

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Flagyl, A Systemic Trichomonacide

Metronidazole (Flagl—Searle), an oral imidazole drug for the systemic treatment of trichomonas infections of the genitourinary tract, has been available since 1959 in France, England and Canada. Sale of the drug in the United States is not yet permitted by the Food and Drug Administration, and it is available only for experimental trial; but because it has undergone clinical trials on both sides of the Atlantic, and has been more or less favorably described by the A.M.A. Council on Drugs, a provisional appraisal is warranted.

It is now widely believed that trichomonas infections are often transmitted by sexual intercourse. In women, the protozoa are sometimes resistant to topical drugs, and in men, the organisms are harbored in the prostate and elsewhere where they are inaccessible to topical therapy. Most trichomonas infections are, however, asymptomatic and require no treatment; where there are symptoms in women, topical treatment, is often effective.

SYSTEMIC TREATMENT—The effectivness of Flagyl in symptomatic infections in women has been shown by controlled trials, with cure rates as high as 90 per cent after one or more courses. The chances of success were found to be only slightly greater, in a few studies, if the male partner also was treated. Failure to respond to Flagyl has been attributed to poor absorption of the drug, reinfection by the sexual partner, and, rarely, to possibly resistant strains of the protozoon. Vaginal suppositories containing Flagyl have been used in addition to the oral drug, but there is no evidence that they yield a higher cure rate than the oral drug alone.

TOXIC EFFECTS—While there is little doubt about the effectiveness of Flagyl, there is doubt of its safety. In experimental animals the drug has an unusual range of toxic effects for an agent to be used clinically in a non-life-threatening disease. These include, though at high dosages, testicular damage with disturbance of spermatogenesis, and neurological disorders such as ataxia and tremor. Clinically the most common side effect has been mild gastronintestinal upset. Headache, drowsiness, dizziness and skin eruptions have been less frequent. In some patients monilial vaginitis becomes manifest or aggravated, sometimes making it necessary to interrupt treatment.

BLOOD DYSCRASIAS—Chemically the drug is an imidazole bearing the nitro-group which has been associated with the occurrence of blood dyscrasias. The frequency of blood dyscrasias is, however, uncertain, since in most of the clinical trials careful blood studies were not done. P. Rodin et al. (Brit. J. Vener. Dis., 36:147, 1960) noted transient depression of the neutrophil count to less than 1500 per cu. mm., without symptoms, in three of 41 patients. No case of serious blood dyscrasis has been reported. The A.M.A. Council on Drugs (JAMA, 183:952, March 16, 1963) notes that the white count is depressed "only infrequently." The manufacturer describes moderate leukopenia in somewhat less than one-half of cases.

Although Flagyl has been given during pregnancy without apparent ill effects, its action on the human fetus is unknown, and the manufacturer does not recommend its use during the first trimester. The Medical Letter believes it should not be used at all during pregnancy; if necessary, topical measures should be used. The drug is excreted in breast milk in concentrations comparable with those in the serum, and since it is not known whether it can be injurious to the newborn and especially the premature infant, the drug should not be used by nursing mothers.

In summary, Flagyl is an effective remedy, but of uncertain safety. It should be used with caution in women, and only if topical measures are not effective. It should not be used in the male partner unless there is reinfection in the female. If it is released for sale in the United States, until there is much greater knowledge of its toxic potential it should be offered for use only in symptomatic trichomonas infections which cannot be controlled by topical preparations. When the drug is used, it should be discontinued promptly if ataxia or any other symptom of nervous-system involvement occurs.

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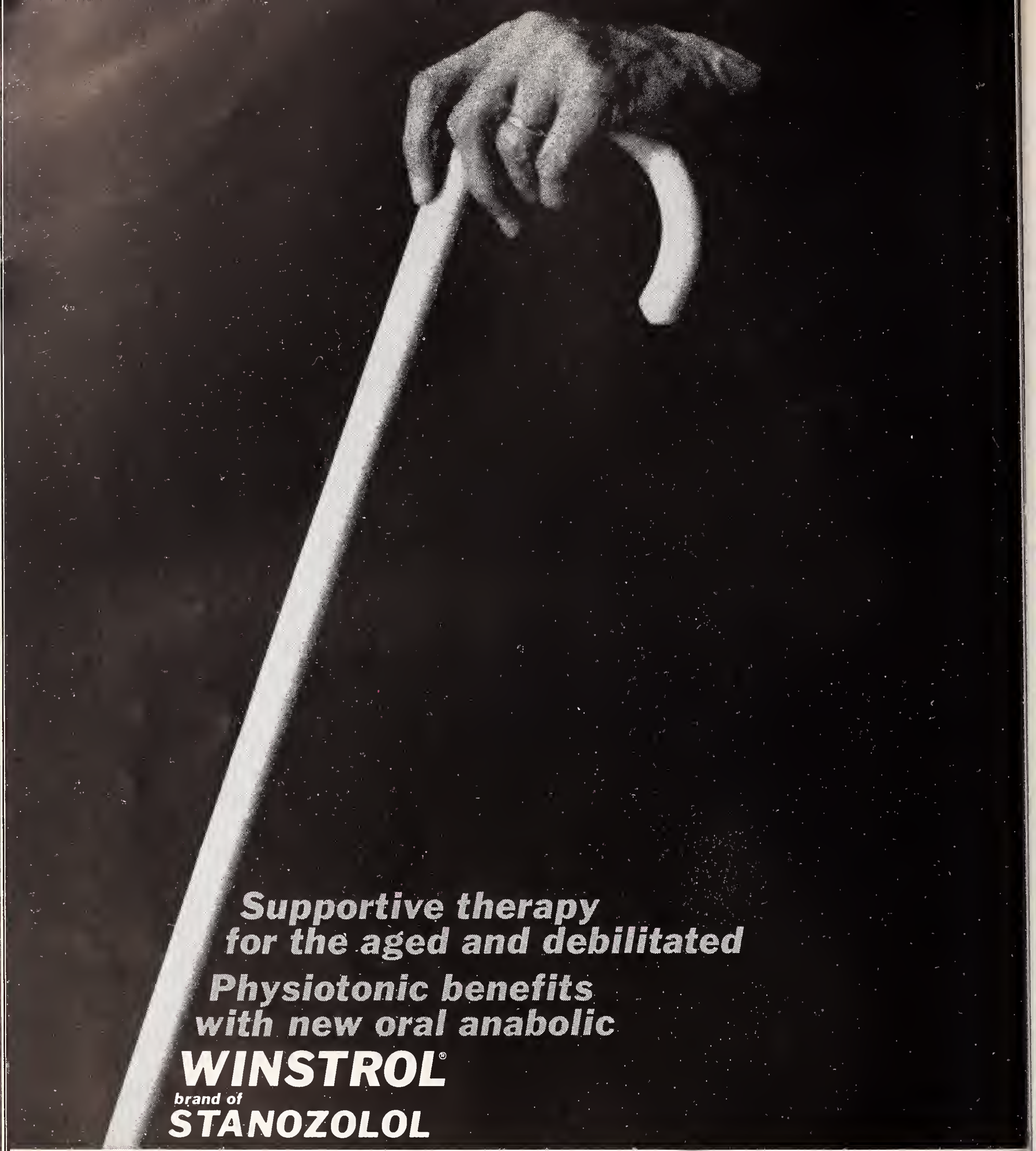

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THE PRESIDENT'S PAGE

The Ethics Of Compulsion

In making my appearances at the semi-annual meetings of the county medical associations, one problem stands out above most others. That is the problem of lack of attendance by members. This has been a perennial problem for as long as I can remember, and several of our counties have recently undertaken to cope with it, sometimes using drastic means which have involved compulsion. Notable among these has been Fairfield County, which two years ago passed a resolution to expel members who failed to attend at least one meeting in four.

Hartford County once considered this method of improving membership attendance, but in New Haven, a "compulsory attendance" resolution was soundly defeated. Everywhere it seems, there is a great aversion toward compulsion. Unfortunately, however, no one has been able to propose a successful method to improve membership attendance without some form of compulsion and, year after year, we are faced with the deplorable situation of having our county functions performed by about 10 per cent of the membership, or even less.

This appears to be more true of the large counties than of the smaller ones, and it has not been rare for a county with 900 to 1,000 members to fail to get the quorum of seventy-five required to conduct a legal meeting. But even the smaller counties are proposing compulsion resolutions, some more drastic than that of Fairfield County.

Obviously, the situation as it exists is most unsatisfactory and it is high time we gave the problem some sincere thought. Let us concede, for the moment, that compulsion is distasteful—particularly to doctors. However, doctors are compelled to do many things they dislike doing, and which they would never do properly were they not required to. I need only mention hospital records and staff meetings to make my point, although, needless to say, there are many other rules and regulations governing hospital practice which doctors are compelled to follow, often against their will. Yet doctors have learned to live with these forms of compulsion and have accepted them as being necessary.

Perhaps the time has come to make evident to our colleagues the need for greater self-discipline in the matter of county association membership, and for participation in county affairs through attendance at business functions. Is there good and reasonable justification for demanding attendance? I believe there is.

The county medical association is important to every practicing physician. Not only does it represent organized medicine at its best in his own community, but it is that branch of organized medicine most approachable by the people of his community. On this account, membership in a county association confers on the physician a status not otherwise obtainable. So important is this recognition that in many communities his hospital demands such membership as a pre-requisite to staff appointment (another example of "compulsion" which doctors have learned to accept).

Because of his county membership, each physician can obtain types of group insurance unavailable to him as an individual. Not the least of these is professional liability insurance. Other forms of insurance now being made available to him through his county efforts are concerned with life, retirement, health and accident and major medical or catastrophic insurance.

There are additional important fringe benefits of membership which each physician should know are made available to him by the handful of members in each county who perform the bulk of the work. Should he be accused of malpractice, whatever the merits of the accusation, he can rest assured that the "peers" who will review his case are his colleagues, not a group of lay people. Should he be faced with ethical problems, the same thing is true.

With so much of value to be derived from county membership, is it enough to pay one's dues to the association and thus consider one's duty done? Apparently, too many physicians think they have fulfilled their obligations by mailing in a check. But that they are wrong about this is apparent in the present status of medicine in America. Everyone must be aware that we are in grave danger of losing our freedom to practice as independent individuals. For years, medicine has been the target for politicians, welfare workers, labor unions, and others determined to mould American medicine into the pattern of other socialist countries, and only organized medicine has had the means to cope with its adversaries. One of the serious faults to be found with those of our colleagues who fail to participate in their county associations' activities is that they remain unaware of the struggle and of its importance to them. Indeed, many are so uninformed that they seem ready to capitulate to what they believe is inevitable, and appear to be taking little cognizance of the great deal being done at all levels of organized medicine to defend their rights and preserve their freedom.

I am confident that the "Georges" among us will continue to do their best for all our members, but their job will be immeasurably harder if their fellows "let" them do it alone.

MORRIS P. PITOCK, M.D.

Athletic Games As A Factor In Physical Fitness

By Daniel F. Hanley, M.D.

And perhaps the reward of the spirit who tries is not in the goal, but the exercise.
—E. V. Cook, *The Uncommon Commoner*

Historical

■ Athletic Games are recorded in the early years of the history of man. If we believe Homer, and accept the coincidence of tradition and archaeology, the year was 1185 B.C., the ninth year of the Trojan War. The occasion was the funeral of Achilles' friend Patroclus. The event was the earliest recorded athletic games of western civilization, if we exclude the tales of the Bull Dancers of Crete, and the legends of the feats of physical prowess of Hercules. At Troy at the time the competition consisted of a chariot race, boxing, wrestling, a foot race, a fight in armor, the discus, archery, and the javelin. These events combined the military art and physical fitness—a combination later adopted as the ideal of the Spartans. It was the Athenians who added mental fitness to this and took as their ideal, the sound mind in a sound body idea, so prevalent in the codes of today's youth.

Even if we regard Homer as a story teller of as late as 850 B.C., he still shows that athletic competition was popular and well-known in his day.

As for the Olympics themselves, still regarded as the greatest of all athletic games, legend explains the fact that the straight-away track at Olympia was longer than others by claiming that Hercules paced off the "stade" in longer steps than ordinary men. Regardless of legend, history tends to prove that the first Olympic festival was held in 776 B.C., and the Greek calendar recorded dates by the Olympiad thereafter. (The second Olympiad was 772 B.C., each four years, etc.)

With the Greeks, physical fitness was the most highly honored of known attainments. Pindar, the greatest Greek lyric poet. wrote odes in honor of the winners at the Games.

The entrance to the stadium at Olympia still has the remains of the statues of twelve men who had cheated at the Games.

Training

From early history until very recently, repetitive practice was used to develop the necessary skills for competition in Games. The years have added size to man's stature, and improved health has added strength to man's efforts. Leisure time available for the enjoyment of athletic endeavors has increased to the point where more people have time to enjoy the rewards of physical exercise.

Today, the "practice makes perfect" philosophy is being utilized to a degree that has never been known in athletics before. The results are in the record books for all to compare—the mile race under four minutes, every other foot race record shattered, the pole vault heading toward 17 feet, and the hammer and discus being thrown further than ever before. Girl swimmers today routinely beat the times of the great male swimmers of a decade ago. And, so it is also with team sports. Practice sessions are longer, more frequent, and better supervised. The result is not only better performance for the record, the result is more importantly, a new standard of physical condition.

Exercise itself is for most of us dull, unrewarding and too easy to postpone. No matter how fancy the format, it still ends up as the old calisthenic drill, which in the line of values of our youth, was a program intended for those who could not or did not compete in athletics. This in itself is regrettable because gymnastics is an excellent form of exercise, and one that can be continued throughout life with a minimum of equipment.

Athletic Games are so numerous and vary so widely in their requirements for physical attainment that the phases "good physical condition," "endurance," "stamina," "speed," "agility," and "coordination" have all come to mean a state of fitness. The time has arrived when the voice of medicine must be heard in the land to say, "physical fitness for what?"

If the goal of physical fitness is longevity, there is little evidence to suggest that Athletic Games of any variety will be of value, except perhaps those games which develop in the participant an empirical knowledge of exercise and a strong desire to continue it, in some form, throughout life. These are the games with a "carry over" value to them.

DR. DANIEL HANLEY of Brunswick, Maine is Director of Student Health Services at Bowdoin College and college physician. He is Executive Director of the Maine Medical Association and Editor of the Journal of the Maine Medical Association. He was assistant physician to the United States Olympic Team in 1961. He has been a participant on many New England Conferences on athletic injuries.

It is obvious that football players sooner or later cease to be football players, and that the active span of years for competitive track, hockey, basketball, etc. is limited. In other games which lead themselves to individual and to team effort, there is a carry-over, an "after school days" component. Golf, tennis, swimming, hiking, cycling, and rowing are good examples of the games which can be continued throughout life, and which are commonly accepted as being of value in keeping the heart-lung machine in good order. But, even here, the actual facts and figures with regard to longevity are few and far between.

The strength of the weight lifter, the endurance of the marathoner, and the delicate finesse of the fencer are expressions of "fitness," but only for the game involved. The weight lifter is not fit to run 26 miles; nor the fencer to press 100 pounds, any more than the average American male is able to walk 50 miles.

The game then is a factor in individual fitness, insofar as it provides the individual performer with a lasting interest in physical activity—an interest which enables the athlete to transfer his skills to less demanding types of physical activity as his maturity ripens, and his arteries harden. No one can or should attempt to keep the level of physical performance of youth, throughout the period of adult life.

The Game concept provides an outlet for physical expression and the opportunity to gain some measure of emotional maturity, by teaching one to live within the rules of the game, or pay the penalty. It provides the opportunity to grind the blade of frustration against the abrasive wheel of opposing player reaction, as well as the opportunity to express aggressive tendencies in a socially acceptable form of physical activity. The emotional factor involved in games is so closely allied to fitness that it must be mentioned here, but only to recognize it as a subject for others to discuss.

The educational process of our culture, which requires of its student body a certain amount of esprit de corps, and a maximum of conformity, leans heavily on group physical activity to obtain them. As the dean of any school will confirm, the energy consumed on the playing field is not available for the less acceptable forms of mass student behaviour. One large university has decreased its "miscellaneous" accident rate, and practically eliminated inter-dormitory water fights by the installation of outdoor basketball courts between the boys' dormitories, and a series of handy putting greens. A factor in physical fitness? Very definitely, when one considers physical fitness in terms of the general health and well being of the college community.

The correlation between health and effectiveness is and has been accepted by society as a positive one. However, it is not always so. As Norbert J. Roberts, M.D., points out, "we have only to call to mind a few effective, but unhealthy colleagues, and others who are healthy but ineffective, to be reminded of this." So that fitness for the task and feats of muscular strength are not always interchangeable.

Summary And Conclusions

Athletic Games have been known since the early days of Western civilization. Physical fitness is not a new concept. The ancient Greeks held it in even higher esteem than the modern Democrats. It is, however, the development of the attitude, of pleasure through physical activity, that is most important in maintaining the interest in physical fitness throughout life. Physical fitness is not a precise term. It has, however, definite connotations for different ages and for different activities. Its goal is not always the same. Games are a growing factor in physical fitness, and in developing both physical and emotional maturity.

Sports with a "carry-over" value appear to be the best.

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Health Organization In The Public School System

By Denis S. O'Connor, M.D.

■ It is unfortunate for us today that the principal purveyor of health should be designated by the term "doctor of medicine" because except for those who are concerned only with the treatment of disease, the term "doctor of health" would point a more positive direction for the advocates of the maintenance of health rather than the treatment of disease.

Actually, the specialty of pediatrics does have this positive orientation in that the pediatrician receives the newborn chld, carefully assesses all the systems, evaluates the health prospects and proceeds to protect the child against those illnesses which medical science has made possible. Unfortunately, this forward orientation is lost in too many cases before the child has reached adulthood and especially during the adolescent period. All too often, the pediatrician is abandoned as the medical adviser while the child is still young and the parents independently choose their specialists.

It is small wonder that even today so many of our young people are arriving at their majority with physical abnormalities, defects, residuals of disease and injury which disqualifies them for military service, not that military service is a goal in itself but physical qualification for it is at least a standard on which we may determine physical fitness.

When one stops to think of the monetary cost alone of bringing a child into the world, of providing for his physical needs and his mental education until he has reached that cut-off date of twenty-one when he is presumed to be self-sufficient, one cannot but be perplexed at the lack of concern, both on the part of parents and of society, for the physical fitness of the organism on which so much money has been expended—to say nothing of the love and affection which is also a part of the parental process. Wide dissent will doubtless be made about this statement but the percentage of failures to meet the physical fitness standards for military duty which has prompted the government to do something about physical fitness stands as an indictment of our child health care.

The causes of this deplorable situation are not single or simple but certainly the failure of our educational systems to give heed to the adage, "a sound mind in a sound body" has not been fulfilled.

The pediatric approach of health maintenance which greets the newborn child of today, the immunizing of the child against the diseases which in former years so devastatingly cut down our children in early life, the well child clinics which have been so valuable in teaching mothers the proper care and feeding of infants has been responsible for bringing our children through their earlier years.

It is probable that through the school years so many of the conditions which are responsible for the decrease in physical fitness of our children occur, and it is in this period of development that measures must be taken if we are to improve the situation. There are three elements in education, mental, physical and ethical.

We ordinarily think of formal education as education of the mind and certainly this is the primary responsibility of our public school system.

The physical development of the individual child also is recognized by our educational authorities as their responsibility and for that reason the unhappy state of physical fitness which is pointed up by the large percentage of failures in our military draft physical examinations must be attributed to them.

To be sure most of our schools require an examination of the child before admission to school. Protection against the specific infectious diseases is also required. We do have nurses assigned to our schools whose responsibility is to recognize ill health of the children and inform the parents. An attempt is made to see that underprivileged children receive supplementary nutrition. The hearing and vision of children is tested and defects reported to the parents. Home conditions are investigated by the school or community nurse. Physical training is almost universally a part of every school system. Athletic games participation is encouraged.

All of this activity is excellent but in most school systems, co-ordination through specialized medical administration does not exist and if we are to improve the physical fitness of our children this must be done.

DR. DENIS S. O'CONNOR, Clinical Professor Emeritus, Orthopaedic Surgery Yale University Medical School and member of the New Haven Board of Health. Dr. O'Connor has had wide experience in traumatic surgery and the relation of orthopaedic diseases to physical fitness.

Unfortunately, the specialty of school health administration does not exist in medicine and the development of such a specialty is probably the most important step necessary if our objective of a finer physical fitness standard is to be attained.

Our schools of Public Health must be expected to provide the training in the necessary subjects to fit physicians for this important work. Presumably, the pediatrician—because of his health viewpoint—would be the logical person for the school health administration although many general practitioners could be said to possess the basic qualifications for such training.

While the required subjects in a course for health administrators would have to be developed, certain subjects such as health recording, physical development standards — anthropology — health education, statistics and research would be primarily obvious.

The development of an adequate health record is an essential step in following the individual from the time of his entrance to the school until he has reached the end of his public schooling. While an adequate examination blank would be absolutely necessary and notations of all illness and injuries must be made, periodic complete re-examinations should also be done emphasizing the problems inherent to the age of development of the child.

The personal element in the examination findings must be eliminated as much as possible in the interest of uniformity and subsequent interpretation. For that reason mechanical recording of data should be employed wherever possible. It is very common, for instance, for significant variations in the auditory recording of blood pressure determinations by various technicians. The use of mechanical recorders would at least eliminate this variant.

While the objective of the plan envisioned by this system is the optimum physical and health status of the individual at the point in life where he should be ready for independent existence or for beginning a separate marital existence, the physical and health welfare at the moment must be the controlling factor in all the decisions made from time to time while the individual is in the school system.

While general overall decisions can be made affecting groups as such, individual decisions must also be made on the basis of known conditions of health or physical handicaps. It would be incumbent upon all members of the physical education department to be so trained in observation that any indication of departure from the physical normal in the individual would be recognized and reported to the proper medical person for further investigation.

The individual student himself must take an active part in the plan of adequate physical and health well being.

Health education as an integral part of the intellectual training of the child must be incorporated into the curriculum. This does not necessarily require a new and separate course of studies but can well be handled in part at some level by the use of health subjects of appropriate status in the reading subjects of the earlier grades and specific lectures and assigned reading at the higher levels.

The extent to which anatomy, physiology and pathological physiology can be made an integral part of the individual's education is a challenging subject.

The education of the parents in the physical and health problems of the different age groups through the parent-teacher associations could do much to insure their co-operation.

As in any competitive activity, health status must have incentives to gradually raise standards.

Reports of the physical and health status of each student should be transmitted to the parents at intervals just as reports of the individual's intellectual progress are made.

A percentile standing on the basis of the standard normal, or a comparative standing on the basis of a particular age group, would enable the individual and his parents to see the child's condition in relation to the normal, or the standard, and stimulate inquiry as to the causes of low standard and measures for improvement.

Prizes for the best physical and health rating and for the greatest improvement over a given period of time might well be added incentive to interest in health and physical well being.

The importance of a high rating in physical and health well being would stimulate children to seek the greatest measure of recovery from illness, or injury, and could well develop at an early age a health safety cognizance of unestimable value.

While the physical activity of the developing individual is an essential element of that time of life, choice of activity cannot always be left to the child since physical ability and personal interest do not always coincide. This is one of the most important reasons why trained medical administration of the school health program is needed. Only by a careful study of accumulated data, plus specific physical examination, can decisions be arrived at as to the desirability of the child's participation in a given athletic program.

While some physical conditions, such as internal rotation of the tibia and pronated feet, must be recognized before school age there are many conditions which appear during the school years which if recognized early and properly treated can result in minimum damage to the individual.

Some of the orthopaedic conditions, such as Legg-Perthes Disease, slipped femoral epiphysis, adolescent kyphosis of the spine, iodiopathic scoliosis, genu valgum, and ankylosis arthritis of the spine may occur during school age and frequently are not recognized early enough to prevent permanent deformity. Fractures in children are common and some fractures result in bony deformities or joint disability. While all of such disabilities may not be prevented by early and interested attention, many disabilities would be prevented or minimized. Unquestionably all specialties of medicine could list conditions which if not properly and promptly handled could result in permanent disabilities.

The gradual development of a more intelligent understanding by parents of the importance of the best recovery from a developmental condition, an injury or disease could in itself be one of the results of better medical and physical supervision of school children.

The time has come for all measures to conserve the senses and abilities of our people at all ages. With life before them it is essential that we do everything in our power to bring our youth to maturity in the optimum physical condition.

It is, therefore, essential that we have specifically trained physicians as administrators of our physical school education. It is encumbent upon our university schools of public health to provide training for basically trained medical personnel in the conduct of this work. Until this is done we may expect to experience the deplorably high percentage of unfit young adults which has been called to our attention by the military authorities for many past years.

Summary

High percentage of disabilities found in examination for military service has alerted our authorities to the poor physical conditions of our youth.

Co-ordination of medical and physical condition of children during school years could do much to improve the physical status of our children.

Physical Education Departments of our schools should be under specially trained medical administrators. School health administration as a specialty of medicine is advocated.

Graduated health education, health incentive measures and parental appreciation of optimum child health are also goals in this program.

Training The Doctor Of Tomorrow

We have been arguing about medical education in America for over two hundred years, but especially during the past fifty years when the arguments have been very heated and, at times acrimonious. We argue about medical education today, and the argument is sometimes filled with confusion. The confusion arises because we are dissatisfied and sometimes frustrated over not knowing how to present, assimilate, and communicate the new knowledge imaginatively that is emerging from research and, at times, we do not define what we are trying to do—that is, we do not define our objectives. Furthermore, confusion arises because it is not wholly appreciated that medical education of high quality has an economic determinant.

There is only one subject matter for medical education and for the education of the doctor, and that is *life* in all its manifestations. All modern doctors today are seeking a better understanding of life and of the insistent present. No more deadly harm can come to us than by depreciation of the present. The present contains all there is, and the only use of knowledge of the past is to equip us for the present, or, as it is carved in stone on the Department of Justice building in our national capital, "The Past is Prologue."

—Chester S. Keefer, M.D. *Training the Doctor of Tomorrow,* Boston, The Boston Medical Quarterly 12: 85, 1961.

Management Of Head Injury In Athletics

By Lycurgus M. Davey, M.D.

I. Introduction

■ It is a paradox that athletic activities which are encouraged to develop physical fitness are also a potent source of injury. The importance of head injuries is underscored by the statistical facts that while they constitute only a small percentage of the total injuries they account for the highest percentage of fatalities[1]; and that while fatalities from abdominal and internal injuries showed a drop in a study covering the period from 1947 to 1959, there was an increase in deaths due to head injuries.[2] Despite refinement and increasing awareness in the diagnosis of head injuries, this pattern has been evident since 1931.[3]

Efforts to prevent such fatalities may be directed toward an appreciation of the nature of head injuries, an evaluation of the causative factors, and the design and proper use of protective equipment.

II. Classification Of Head Injuries On The Basis Of Severity

Classification of head injuries into three groups according to severity should provide a better understanding of the nature of such injuries and offer a sounder basis, for physicians and trainer alike, in the management of these injuries. Since about half the injuries occur during practice sessions when a doctor is not likely to be in attendance, it is essention that both coaches and trainers be aware of the nature of head injuries that might be encountered.[4]

Group I includes those players who have received a direct blow to the head but who have suffered only fleeting or no actual loss of consciousness. If such a player has no retrograde amnesia, that is, if he can remember the play on which he was injured, if his memory for time, place, or person is unimpaired, and if he shows clarity of mentation, that player probably may return to the game. Should he complain of headache, a great sense of fatigue, dizziness, or nausea, he should be sidelined temporarily, at least. When these symptoms persist, medical observation would seem appropriate. The following case is presented to show that even with apparently mild injuries and with medical observation fatalities cannot always be prevented.

Case Report 1

J. G.—New Haven Hospital, B58806. In the second period of a game on September 29, 1944, this 17-year-old high school student was tackled and struck the left side of his head. He did not lose consciousness and continued to play until the 4th quarter. Over the next six days he had persistent headache and periodically both nausea and vomiting. He was referred to the school physician for these symptoms. X-rays of the skull showed no abnormality. Within another two days days he began to get drowsy, and he was referred for admission to the hospital where the examining physician described him as mentally alert and not drowsy. Except for a slow pulse, not uncommon for a well-trained athlete, his examination was within normal limits. With varying degrees of intensity his headache continued, and at times he appeared drowsy. On the day of his death, October 10, 1944, the record indicated that at 1:30 A.M. he was awake and complained of being hungry. At 3:10 A.M. he was found in a state of restless coma. He was taken to the operating room because the presence of a subdural hematoma was suspected, but before he could be operated upon respirations ceased. Despite supportive measures he died at 4:25 A.M.. Autopsy revealed a subdural hematoma in the left parietal area.

Group II includes those players in whom there has been a significant alteration though no prolonged loss of consciousness. These patients are more likely to show retrograde amnesia, some defect in memory, and their thinking may be quite muddled. Usually they will not remember the play on which they were hurt. If their injury has gone undetected, almost invariably they miss their assignments on the next play or two. Once out of the game, they often appear dazed and may be described as "punchy." Not infrequently they walk around with a silly grin asking the same questions repeatedly, most commonly "what happened?" If these symptoms do not disappear within a matter of a few minutes and particularly if the player continues to complain of headaches, visual disturbances, dizziness or lightheadedness, sense of fatigue, nausea or vomiting, he should be hospitalized for

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a perod of at least 24 hours' observation. The difficulties and treachery of making appropriate judgments in these cases is illustrated by the following case.

Case Report 2

D.H.—New Haven Hospital, 37-78-05. This player was a 19-year-old college student who played briefly in the 4th quarter of a game and was kicked in the jaw. Loss of consciousness, if any, was only momentary. He was able to continue in his regular routine and ate supper at 6:45 P.M. with his roommate, who noted no abnormal behavior. At about 7:00 P.M. he called his mother in New York and said that he was ill. On the telephone he talked in a peculiar manner and hung up abruptly. At 7:30 P.M. he was found in his room vomiting and in a restless semi-conscious state.

In this condition he was brought to the hospital and immediately taken to the operating room where a large left temporal intracerebral hematoma was found and evacuated. Two days later he showed signs of reaccumulation of clot, had a second operation, but expired shortly thereafter.

Unfortunately, an autopsy was not permitted. We shall never know whether this case really represents a fatality due to a football injury or whether this patient may have had a vascular anomaly which bled spontaneously and totally unrelated to the football injury.

Group III includes those players who have suffered definite or profound loss of consciousness, convulsions, or open wounds of the head. Prompt hospitalization of such players is generally necessary, special care being taken in the movement of the patient as there may be an associated injury to the cervical spine. It is commonly conceded that except in unusual circumstances such serious head injuries are better transported to a neurosurgical center than transporting the neurosurgeon to the patient. In this group of head injuries further participation in contact sports is probably interdicted.

IIII. Management Of Head Injuries On The Field

If a player has received an injury to the head sufficient to necessitate calling a time out, it would seem unrealistic to ask the team captain or the team's trainer to make a decision about the nature of the head injury in a few seconds when the neurosurgeon may not be sure about the answer even after several hours' observation. It would seem more prudent to remove the player from the game and to ask the team's physician to evaluate the man's condition and to determine whether he should be allowed to remain in the game, be sidelined, or even be hospitalized.

With the more serious injuries to the head the man must not be manipulated beyond that required to provide an adequate airway and a comfortable position. Since unconsciousness may also result from injuries to the cervical spine, care is essential in handling the head and neck lest further damage to the spine and irreparable harm to the spinal cord be caused.

It is a matter of practical importance to determine when a player may be returned to the game. If a player is mentally clear, has no headache, and seems rested, he may return to play if his injury falls into Group I. In Group III, further participation in contact sports probably should be prohibited even though recovery may seem to be complete. It is in Group II in which great pressures are frequently brought to bear upon the team physician by the man himself, by coaches, and by other well-meaning friends to allow the player to return to the team immediately. Despite emotions generated by the game, the physician must remain a stabilizing influence and decide solely on the patient's objective findings how soon he may return to the game. In the case of a player who has lost consciousness more than fleetingly as a result of a head injury, the decision should be fairly clear. The man should be hospitalized for at least 24 hours' observation and should be kept from actual contact for about one week. If he remained free of symptoms during the week, he could return gradually to practice work-outs but without body contact.

In deciding when a man may return to the game not only the physical but also the factors of motivation and temperament should be taken into account. A well motivated, highly agile, first stringer is less likely to be reinjured than a slower moving indifferent substitute or a hot-headed player who has taken the injury as a personal affront.

Often the question is raised whether cerebral trauma constitutes a contraindication to further participation in contact sports. It has been suggested that three or more cerebral concussions constitute such a contraindication.[5,6] While this may be a fair general rule, the answer is not all that simple. Obviously in Case 1 cited above one concussion was more than enough and in boxing the third knockdown stops only the fight in progress but not future participation. Certainly a second injury in the same game should be sufficient reason to remove the player for the day.[6] As to future participation it would be wiser to evaluate each case individually, including, if necessary, referral to a neurosurgeon to assess the degree of actual cerebral trauma. If no evidence of damage to the brain is found on neurological examination or by electroencephalography, in selected cases, and if, in the case of multiple incidents, the pattern of injury producing the concussion has not been too closely identical, such a player may resume contact sports with no more danger than any other participant.

IV. Preventive Measures

Preseason examinations are essential to eliminate players with neurological contraindications to participation in contact sports. Some of these conditions are obvious from the history and examination. They include postcraniotomy states, laminectomy for ruptured intervertebral disc or tumor of the spinal cord, and epilepsy. Others are not so obvious, such as intracranial aneurysm or vascular malformation, which are usually silent unless they have bled in the past.

Among preventive measures there is little need to stress the importance of training, conditioning, and practice in fundamentals to improve skill. Proper development of neck muscles is essential to minimize injuries to the head and neck. Deficiencies in these prerequisites along with faulty execution and fatigue are prime causative factors in the incidence of head injuries as demonstrated by their more frequent occurrence early in the season before the first game, in spring practice, and in the 3rd and 4th quarters of the game.[4,7]

The difficulty in amassing statistics in the evaluation of head injuries is due to the many variables present from year to year and from squad to squad; for example, a team with hard running backs may have a higher incidence of concussion.[8] In a review of several articles the incidence of head injuries ranged from 2.2 per cent to 6.5 per cent. Table I is a composite of these statistics and shows 8,586 total injuries with 386 head injuries for a percentage of 4.5 for the latter. From this compilation it was impossible to determine the number of fatalities due to head injuries, but at the Annual Meeting of the National Collegiate Athletic Association 13 deaths directly associated with football were reported to have occurred during the 1960 season. Approximately 71 per cent of all the fatal accidents resulted from blows to the head. By contrast a review of fatalities in the 32-year period from 1918 to 1950 showed that six of 22 fatalities in football were the result of head injuries for a percentage of 27.3.[11] Of fatalities in other sports this author indicated that 15 of 21 were by head injuries in boxing, 27 of 43 in baseball, while only 2 of 7 resulted from basketball.

Table I

Incidence of Head Injuries in Athletics

AUTHOR	TOTAL INJURIES	HEAD INJURIES	PER CENT HEAD INJURIES
Thorndike[5]	7090	312	4.4
McPhee[9]	928	60	4.4
Condon[10]	448	10	2.2
Hibbert[4]			3.6
Reid[7]	120	4	3.3
Total	8586	386	4.5

Protective equipment has reduced fatalities from other injuries and the question naturally arises as to whether a better protective helmet can be devised to minimize the force transmitted to the brain from blows to the head. Research conducted at the Cornell Aeronautical Laboratory, Inc.[12] recommended the following minimum standards for protective head gear for body contact games: (1) reduce the magnitude of the blow to the head; (2) distribute the remaining force received by the head over as wide an area as possible; (3) prevent lacerations and abrasions of the scalp. The basic properties of a good crash helmet for aviators and motorcyclists has been described by Rawlins[13] as follows: (1) resistance to peneration or to deformation of the skull; (2) reduction of acceleration; and (3) absorption of kinetic energy. The crash helmet must be as light as possible, comfortable, cool to wear, and efficiently secured to the head. Further, the helmet should be tough, rigid and not elastic, and the surface should be free from projections to minimize torque. The surface should be smooth and have a low coefficient of traction to facilitate sliding over an opposed surface. By uniform deformation it should smooth out the acceleration curve. It should convert kinetic energy to energy of compression or extension. Finally, it should spread the blow as widely as possible over the head. A lining of sponge rubber and a suspension harness added to a rigid helmet fulfill most of these criteria.

Finally, in the search for a better designed helmet some speculations might be made from clinical experiences with severe craniofacial fractures. Cases are frequently seen with compound fractures of the frontal sinuses and lacerations of the dura and brain but without loss of consciousness. Presumably the two thin layers of bone separated by the air space of the frontal sinuses dissipate the force of the blow and spread it over a wider area; thus, while the force is sufficient to cause a laceration of the brain by indriven fragments of bone, it is not enough to produce unconsciousness. This is in contrast to the profound unconsciousness which may be seen in other severe head injuries without fracture and despite the use of a crash helmet.[14] Perhaps a plastic helmet composed of two layers with an air space between could be designed with padding and suspension harness to afford more nearly ideal protection.

Summary

Head injuries in athletics constitute a small percentage of the total injuries, but the highest percentage of the fatalities. Despite these percentage figures, the actual number of such injuries is small considering the vast number of participants, and occasionally it is difficult to lay all the blame on athletics as illustrated by Case 2. For the individual the injury is not a statistic but a serious threat as in Case 1. It is for the sake of such individuals that this effort is made to simplify for the non-specialist the evaluation, management, and disposition of head injuries and to consider preventive measures including the design of protective equipment. A novel idea for a helmet design is presented.

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Giovanni Battista Morgagni, The Founder Of Pathologic Anatomy

The great estimation in which Morgagni was held is best revealed by his intimate relationships with learned men of his time, such as Ruysch, Boerhaave, Mead, Haller, and Meckel. This wide acquaintanceship brought him recognition fom all parts of the world.

Morgagni was elected to the important royal societies and academies of his day—England, 1724; Paris, 1731; St. Petersburg, 1735; and Berlin, 1754.

All these distinctions did not seem to disturb the patriarchal serenity of Morgagni. To quote the concise expression of Walsh, Morgagni was "a simple, happy man of domestic tastes. . . ."

Nature sometimes seems to take pleasure in releasing the boundaries of time for those laboring in behalf of the common good. Morgagni lived to be eighty-nine years old and, to the last, retained clearness of thought and limitless energy.

Morgagni had seen and assembled in his five books the major facts in the gross representation of disease from head to heel—*a capite ad calcem*—and had succeeded in laying them, in orderly fashion, before a bewildered medical world in one of his greatest classics.

It would be a mistake to consider the *Seats and Causes of Disease* a book of pathology in the modern sense. It could better be identified . . . as a medical work with anatomic explanations of disease symptoms. The uniqueness of the work lies in its complete correlation between the patient's ailment and the post-mortem revelation. The "anatomical concept" (*Gedanke*), as Virchow called it many years later, had broken the humoral speculation on the essential nature of disease by disclosing its perceptible seat.

—C. G. Tedeschi, M.D. *Giovanni Battista Morgagni, The Founder of Pathologic Anatomy: A Biographic Sketch On The Occasion of the 200th Anniversary Of The Publication Of His* "De sedibus et causis morborum per anatomen indagatis." The Boston Medical Quarterly 12:118, 1961.

The Athletic Team Physician In The Secondary School Program

By Frank Mongillo, M.D.

■ In the not too far distant past when medicine was less highly organized and specialized it was common practice for an athletically interested physician to make himself available on a voluntary and a non-remunerative basis to the football squad of the local high school. The vigorous nature of football, its high incidence of injury, and its short intensive season were major reasons for the interest on the part of physicians.

While football, more than other athletic activities, requires more medical supervision, other athletic activities do require some medical supervision if unfortunate, and even tragic, results are not to occur occasionally.

The changes which have occurred in medical practice, with more highly organized offices and the employment of para-medical personnel, require a more businesslike attitude toward medical practice on the part of doctors and volunteer medical supervision is *not* now available as it was in times past. Furthermore, the legalistic attitude which parents today have toward every untoward incident affecting their children, as well as the universal insurance of school children, makes it difficult for any doctor to place himself on a volunteer basis.

Actually, it is the responsibility of the community as represented by the Department of Education, or the Athletic Association of the school to provide medical coverage for students engaged in hazardous athletics.

While such coverage is not universally provided for at present, we may expect to see such coverage increasingly supplied in the future, if for no other reason than to modify the insurance premiums.

The athletic team physician presumably would have contractual arrangements as to the amount of time he would devote to the care of the students engaged in athletic endeavors and his time, therefore, would vary with different contracts.

In a gradually emerging use of medical talent, hard and fast duties and responsibilities cannot be expected to exist.

Those who over the years have given voluntarily of their time and knowledge to athletic activities have by experience developed a body of duties and responsibilities.

It would be assumed that any student of secondary school age engaging in a hazardous activity would have the authorization from his parents to engage in that activity. Knowledge concerning this authority would be the responsibility of the school authorities and the appearance of the student in the program would pre-suppose that such permission had been obtained. It might be well for the medical supervisor of an athletic activity to require from the school authorities a list of students authorized to take part in any given activity.

Permission to take part in an athletic activity should carry with it authorization for an overall physical examination by the activity physician to determine if the individual is physically qualified to undertake the strains and stresses of the particular sport and to evaluate any medical problem which might be aggravated by such activity.

The physical examination must be something more than a casual application of a stethescope to the chest and actually should be a comprehensive examination, specified by a higher medical school authority if one exists or an examination specified by the contractual authority.

Any information obtained through the physical examination which might have a bearing on the hazards inherent in the athletic activity should be made known to the coach who is the immediate responsible individual for the training of the participants.

While the physician has no function in the procuring of equipment, he should be charged with the consideration of the safety factors in that equipment and as such should be sought as an adviser by the procuring agent, and failure of the coaching staff to consider safety factors should be reported by the physician to higher school authorities.

DR. FRANK MONGILLO of New Haven is well known for his deep interest in many community activities but notably in affairs having to do with youth activities. For many years, in spite of his tremendous medical practice, he has found time to care for the athletic injuries for several schools in the New Haven area and has become somewhat of an authority in this field.

While the personal attendance of a physician cannot be expected during all practice sessions, the physician should have assistants on the field at all times and he should be readily available at all times to respond to calls for emergencies. His assistants on the field should ascertain what, if any, injuries or complaints have arisen during a practice session and report them to the team physician on the basis of which the physician should call in any participant whose complaints or injuries require professional evaluation.

While it would be the responsibility of the team physician to provide the necessary emergency care of any injured player his continuation in the care of an injured player would be based upon the attitude of the parents of the injured student. In the absence of a clear request by the parents, the care of the student for a specific injury would devolve upon a doctor of the parent's choice.

The team physician would be expected to keep a sharp eye on the students engaged in a particular activity with a view to determining any unfavorable appearance in the student's condition. Instructions governing living and eating habits should be given by the team physician and practices inimical to good condition should be frowned upon, if not positively banned.

The relationship of a team doctor to the boys engaged in an athletic endeavor places the doctor in a very favorable position to influence the boys favorably on matters which may be important to their future health.

The importance of posture in health, the condition of the feet to future activity, the early indications of high blood pressure, the importance of teeth, the danger of cigarettes and alcohol liquors are only a few of the problems early recognition of which and consideration of ultimate results may do much to prevent future misery.

The importance of medical supervision of secondary school students engaged in athletic activities must be realized by our educational authorities, and parents have the right to insist that their children, in return for their participation in sports be protected against preventable untoward results.

Art And Science In Medicine

When we compare science and art in medicine we find that, to use a mechanical analogy, the former is enormously the more efficient engine where it is availably. Its only necessary fuel is knowledge—given knowledge and the appropriate case, success with a very small margin of error is certain. Medical art on the other hand is an engine extravagantly inefficient and needs every faculty of the doctor to get it to work at all. This is why it is that he has not only to be taught but to be trained. By teaching I mean the imparting of knowledge, and for that we are dependent on our teachers; by training I mean the cultivation of aptitude, and for that we are dependent on our opportunities and ourselves. It is here that we see most clearly the difference in the requirements of experimental science and of an art. Th exactitudes of science call for the elimination of human faculty as far as possible; the lack of exactitude in the practical art calls for the use and expansion of human faculty as far as possible. It would be a poor physiologist who used his eye to estimate the weight of guinea-pigs or his tongue to measure electric currents; but the physician who makes the fundamental observation of medicine and says, "My clinical instinct tells me that man is ill," though he uses an instrument with an error deplorably great, uses the only instrument capable of making any record at all, and will do well to keep it in repair.

—*The Collected Papers of Wilfred Trotter, F.R.S.* London, Oxford University Press, 1946, p. 96.

Conditioning For Secondary School Athletic Activities

By Edward D. O'Donnell

■ Specialized association of a word can often result in a limitation of its application. This is true of the conditioning which has become so commonly applied to the preparation of athletes for activities in that field that its application to every day life and to the physical rehabilitation of the individual in medicine is seldom knowingly applied.

While a consideration of conditioning in medicine is a subject about which much could be written, this paper has a sharp limitation to the athletic activities in the secondary school program.

In the colleges and universities, conditioning for athletic activities occupies an important place and requires a large and expensive organization to insure that athletes are physically in optimum shape for the activities in which they take part.

Conditioning is no less important in the secondary schools but certainly in the average public high school the expense of separate organization is usually not feasible and, therefore, that work must be a responsibility of the coach of a particular sport.

Since good condition of the athlete is of primary importance to the successful pursuit in any athletic activity, the coach who in reality is a teacher of a special subject, should be well grounded in the appreciation of conditioning and an athletic department or team physician should also know enough about the subject to evaluate the athlete's condition from observation.

As was stated before, a coach is really a teacher of a special subject. The conditioner is not a teacher as much as a developer of the raw, or inadquate, physical specimen into a highly co-ordinated, mentally alert and physically qualified person for a particular sport.

Different activities require different types of conditioning. Swimming requires endurance, speed, co-ordination and lung capacity. Baseball requires speed, a very high degree of co-ordination and agility. Boxing requires foot work, alertness and powerful arm power. Running, depending upon the distance, may require endurance for the long run but speed for the sprint. The good conditioner not only knows what is required for the particular sport but he knows what the candidate must do to acquire the qualities to be most effective.

In most school activities sufficient time is available to bring the athlete to his high point of physical condition except in football, a sport that requires an exceptional degree of physical fitness at the beginning of the football season which coincides with the beginning of the school term in the fall.

Since conditioning is a gradual process aiming toward an optimum physical state for football it must be begun in the hot months of July or August when school is not in session and the conditioning work must be done by the individual without the supervision of the individual who must be responsible for his conditioning.

Work activity of a nature requiring the constant development of all the muscles of the body is probably the best type of exercise for the football candidate. This work activity is found in outdoor construction work or physical instructing in a camp. But since work activity of the right type is not universally available specific exercises have to be undertaken if the individual is to be in available condition for the arduous training in football technique at the beginning of the season.

There are certain general rules which may be laid down for conditioning work.

1. Start in slowly.
2. Be sure the muscles to be used are brought to the proper temperature before maximum effort is to be required of them.
3. Consider the hazards of what you are doing and take the proper precautions against injuries which may delay your conditioning or actually result in your elimination from participation in the game.

The availability of a good beach, such as is found at the seashore, can be a desirable location for many of the activities associated with conditioning. Long stretches of firm, sandy beach are ideal for walking, running, falling, kicking, throwing, pass-

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MR. EDWARD D. O'DONNELL, formerly head of the Conditioning Department of the Yale Athletic Association and also Varsity Wrestling Coach, has been the head of the Physical Therapy Section of Yale University Health Department for over thirty-five years and has had wide and intimate contacts with athletes and their injuries.

ing, dodging and swimming. The element of play and relaxation which is also present makes such a location ideal. It is also ideal for some of the technical maneuvers of football such as kicking and passing.

Before considering specific measures to be recommended to candidates it might be well to give a few words of advice for general hygiene.

It is generally recognized that smoking is bad for respiratory efficiency, or "wind," and therefore should not be indulged in. It seems hopeless to expect that this advice will be accepted by the athlete but since his efficiency may be a prominent factor in his football career, he must make his decision.

Alcoholic liquors are not a particular problem at secondary school level and probably require no emphasis.

Eating habits, likewise, are probably of minor importance but it might be well to emphasize the importance of regular meals, avoidance of between meal snacks and elimination of sweets.

Adequate hours of sleep and avoidance of excessive fatigue are also important measures to be recommended.

Since conditioning for the football season is to be in optimum condition for that rugged contact sport hardening of the tissues to withstand bruising, endurance to withstand several hours of sustained intense activity involving running, falling, tackling and blocking and toughness to withstand the inevitable punishment, weeks of preparation are necessary.

All the possible exercise which would help in this process cannot be specified. The exercise listed below constitute only an outline. Do not lose sight of the purpose of the exercises. They are to put you in condition to meet the strains of football training at the start of the season.

Assuming that the candidate will start his conditioning in July, the following measures should be recommended:

1. *Running*—This should be started slowly and gradually worked up to a one-mile distance. It should include backward, forward, sideward and zigzag running. Occasionally, include a 50-yard sprint. Running to strengthen the knees should not be on a level surface which does not tax lateral ligaments but rather try to work in some cross country running on soft soil or uneven ground.

2. *Squatting*—Full squats are bad for knees. Never do them more than half way. A half squat and a jump into the air done 25 times helps develop the thighs and calves. Conditioning exercises carefully planned and vigorously pursued will build strength, flexibility, and endurance.

3. *Piggy-back Running*—Try and get a partner and run with him on your back over a 50-60 yard distance. This should be repeated 10 to 15 times.

4. *Push-ups*—The number of push-ups should be gradually increased from 10 to 30 times. This should be done on finger tips rather than full palms.

5. *Sit-ups*—On this exercise the hands should be placed behind the head. This is one of the best abdominal exercises you can do. Start with 25 and increase the number to 50 as the weeks go by.

6. *Pull-ups*—Pull-ups start with five and increase to your maximum. Some players start with 10 or more.

7. *Wrestler's Neck Bridging* — To have a strong neck requires bridging exercises to strengthen the muscles in all directions for football. This exercise is a must on this program as football requires a strong, yet flexible neck. Do this both forward, backways and sideways and gradually increase with resistance.

8. *Running On All Fours* — This exercise will assist linemen greatly because it semi-simulates game stance. All squad members should do this exercise forward, sideward and backward. Repeat at least 15 to 25 times. While running on all fours, alternate with regular jogging.

9. *Walking On Tiptoes*—By doing this over a 100-yard distance, alternating it with 50-yard jogs, and repeating 10 to 20 times, in bare feet you can harden the skin and reduce the changes of blisters when you return in September. Another excellent way of preventing blisters is to occasionally go without socks.

10. *Sitting On Floor And Standing* — From a standing position, sit on the floor, roll to the other side and stand up. Alternate standing, first to the left and then to the right 50-75 times.

While the exercise regimen for August is not unlike that for July there is a different emphasis in that one may expect that some improvement in conditioning has taken place. Certainly anyone faithfully following the plan outlined above should be able to report to the coach in shape to undertake the several hours of signal running and scrimmage almost immediately.

With the beginning of the active football season, the conditioner's position becomes one of critically observing the condition of each player insuring proper costuming—especially helmet shoes, watching the weight chart of each player, strapping or bandaging of weak joints and evaluating complaints and minor injuries.

A knowledge of the technique of applying support to various joints is one that any conditioner must know and the successful use of such supports can decrease the incidence of injury.

The conditioner must also develop keen judgment in regard to the importance of injuries. He is the first person who is called to evaluate an injury on the field and his judgment, as well as his decision in regard to continuation in the game of an injured player, must not be influenced by anything except the welfare of the injured man.

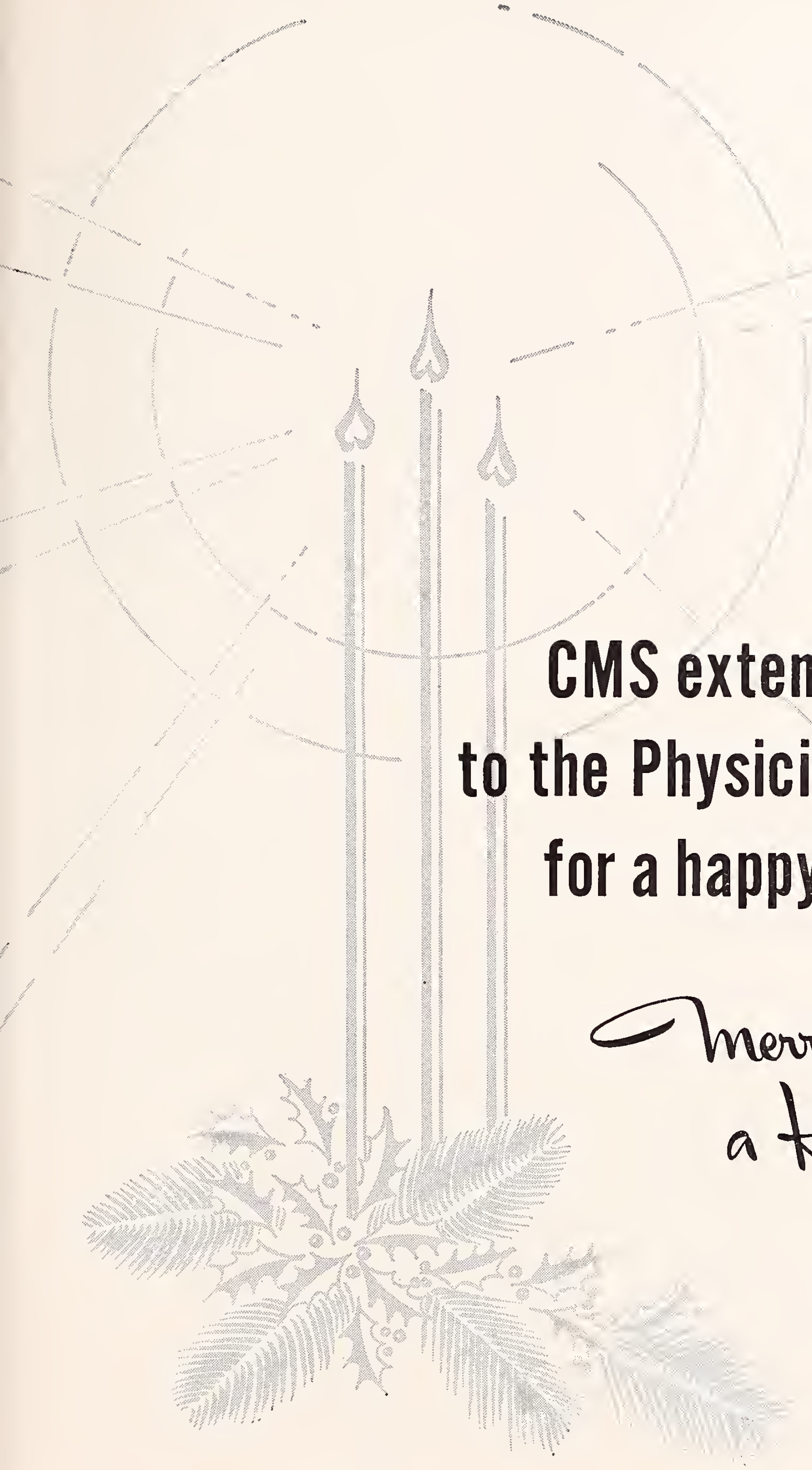
The conditioner is the doctor's representative in close relation to the players. He must have the judgment to know when the simple measures of heat and massage are not sufficient to meet the injury and insist that the advice of the team physician be obtained.

Football is a sport in which injuries are common. Conditioning is the first line of defense against injury. Prompt recognition of minor injuries and the application of decisive measures to keep the injuries minor can do much to allay the concern of parents of students engaged in the game. Even the continuation of football as a secondary school sport may depend upon the increased safety which good conditioning may bring.

For many years friends have encouraged me to write my memoirs. They claimed that Parcae had not cut the thread in my life only to give me an opportunity to report what I had observed in connection with the history of the profession of the country in a medical practice extending over almost sixty years, as a public teacher of medicine during forty-five years and a member and an officer in many local, national and international associations. That may be true, but as a memoir writer I have not succeeded in being prolific beyond a few chapters which, with others, may or may not reach the eyes of my friends and enemies for a long time to come, if at all. A very good reason for that is intelligible to every New Yorker. We have no time for anything but work; the luxury of leisure we do not possess, and pleasure is enjoyed only, or mostly by those who find pleasure in work.

So no memoirs could be written on account of constant and constantly pressing work. Pegasus wears no harness, and I, like most of you, have always been in harness. Whether that was always an enjoyment or a benefit to others I, cannot tell you. But I believe, I may assure my present readers that my professional life taken all in all was very successful if not always lucky or happy.

—W. J. Robinson, Editor, Preface to Contributions to Pediatrics, *Critic And Guide,* 1909.



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to the Physicians of Connecticut
for a happy holiday season.

Merry Christmas and
a Happy New Year

Clinical Medicine

Radiation And Carcinoma Of The Thyroid

By Dorothy R. Hollingsworth, M.D.

I. Introduction

■ Radiation has been recognized for many years as a carcinogenic agent and a number of excellent reviews have been written on the subject.[1-4]

The extensive use of I^{131} and X-irradiation as diagnostic and therapeutic agents plus the increasing concentrations and uneven distribution of I^{131} in fallout have contributed to the interest in the role of radiation and the subsequent development of thyroid carcinoma.

II. Thyroid Neoplasia Following Irradiation In Animals

Ionizing irradiation may produce neoplasia by either direct or indirect mechanisms. Warren[5] in 1943 noted that the thyroid was relatively resistant to the direct effects of x-ray and radium implants. Since then evidence has accumulated supporting thyroid tumorigenesis related to "indirect effects" or failure of a feedback mechanism that is induced by radiation in endocrine tissues.

The thyroid is a target organ under the control of pituitary thyroid stimulating hormone (TSH). It has been demonstrated by several investigators[6-12] that any alteration in hormonal balance between the thyroid and the pituitary resulting in an increased level of TSH secretion will cause tumor formation in the thyroid.

Bielschowsky[13] reviewed the role of thyroid hormone deficiency in tumorigenesis in the thyroid and pituitary in 1955 and pointed out that benign and malignant neoplasms of the thyroid of rats and mice occur (1) "after administration of goitrogenic substances alone or in combination with carcinogens. (2) After administration of radioiodine alone or in combination with goitrogens or acetyl aminofluorene. (3) After feeding an iodine deficient diet." All of these procedures alter the hormonal balance between the thyroid and the pituitary resulting in an increased level of TSH secretion.

Doniach has summarized his experiments on thyroid carcinogenesis in the rat in a review in 1958.[14] His data suggest that radiation may "initiate" neoplastic cells perhaps in a manner comparable to that of the carcinogen 2-acetylaminofluorene (A.A.F.) and these cells are then "promoted" to tumor formation by the goitrogen induced TSH stimulation.

Large and small doses of I^{131} increase TSH secretion in experimental animals. The dose of I^{131} is important however because after very large doses the thyroid is unable to respond to the stimulus of increased TSH. The combination of goitrogens and irradiation has been found to be particularly effective in causing thyroid tumors.

III. Radiation And The Human Thyroid

A. CHILDREN AND ADOLESCENTS

Attention has been called to the development of thyroid carcinoma in children following X-irradiation to the head and neck following treatment for an enlarged thymus, tonsillar hypertrophy, mastoiditis, sinusitis and cervical tuberculous lymphadenitis. The infant thyroid theoretically presents an ideal setting for carcinogenesis. Although the adult thyroid no longer undergoes cell division or an increase in size, the infants gland normally undergoes mitotic cell division and grows from a weight of 2 grams in infancy to 25 grams as a young adult.

There is some evidence that these rapidly developing cells are quite sensitive to irradiation. Werner, Hamilton and Nemath[15] reported in 1952 that 4 of 6 children they were studying for hyperthyroidism achieved a complete remission following diagnostic doses of I^{131}. In addition the uptake of I^{131} is irregular and some parts of the gland may receive a much larger dose than others. Sheline et al[16] found thyroid nodules in two of five patients who received treatment with I^{131} for hyperthyroidism before the age of 10. In one of these patients there were invasive changes suggesting early malignancy. In only two of 195 patients treated beyond the age of 20 were nodules known to have developed a year or more after therapy.

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The first report of the possibility of thyroid carcinoma as a sequela of irradiation in the very young was that of Duffy Fitzgerald[17] in 1950. Their review of the Memorial Hospital experience revealed that of 430 cases of carcinoma of the thyroid diagnosed between 1932-1948, 28 were 18 years old or younger at the time of diagnosis. Ten of the 28 cases had received irradiation of the thymus during infancy between the fourth and sixteenth months.

In 1955 Simpson and Hempelmann[18] described a follow-up study of children who had received X-ray therapy to the thymic area between 1926 and 1951 in which they found the number of cases of carcinoma of the thyroid to be higher than in untreated siblings or the general population. The data were reported in greater detail in a later article.[19] Eighty-seven per cent of a group of 1722 children who received radiation to the thymus were traced; 1933 untreated siblings served as controls. Among the treated group, 18 cases of malignant tumor of varying location occurred, and 17 of the 18 were diagnosed between the ages of 5 and 20 years. In the treated children 15 have had thyroid nodules removed before the age of 20, and two others have had surgery advised for nodules. Only one control sibling has been found to have a thyroid adenoma. The occurrence of carcinoma of the thyroid was particularly significant with 10 cases noted in the radiated children and none in the siblings.

This study pointed out for the first time that relatively small doses of radiation (200-600 r) might be responsible for thyroid tumors in man.

Clark in 1955[20] made a survey of all his cases of carcinoma of the thyroid in patients below the age of 15. He reported 13 cases, all of whom had had previous irradiation at ages 2 months to 6 years. The latent period for the development of the carcinomas was 3-10 years. Again, the doses received by these children were not large and ranged from 200 r to 725 r in 11 of the cases.

In 1956 Majarakis[21] et al noted that 10 of their 15 children and adolescents with thyroid carcinoma had had head or neck irradiation between the ages of 2 months and 6 years with the relatively small doses of 200 r to 625 r. None of the 5 patients over age 15 had received prior irradiation whereas all 10 children under the age of 15 had received such treatment.

Fetterman, in the same year,[22] found eight of 10 children under the age of 16 had irradiation of the face, neck or chest 3-12 years prior to the diagnosis of thyroid carcinoma.

Evidence linking carcinoma of the thyroid with irradiation in children continues to accumulate. Baron in 1958[23] added 7 cases. Rooney and Powell[24] describe 10 patients in Atlanta, Georgia, below the age of 17 with carcinoma of the thyroid. Seven of the 10 received X-ray therapy for benign conditions in infancy or early childhood. Crile in 1959[25] reveiwed the Cleveland Clinic experience and noted that in 18 consecutive cases of carcinoma of the thyroid in children between the ages of 3 and 15 years that 11 had received irradiation in the first four years of life.

Wilson and Asper[26] surveyed 37 patients below the age of 25 years with proven carcinoma of the thyroid. Sixteen (43 per cent) had a history of prior irradiation to the head, neck or chest.

Conti et al[27] have recently reported a follow-up study on 1,564 Pittsburgh children who received irradiation to the thymus. In 1,386 of the patients the dose was less than 200 r. No cases of carcinoma or leukemia were found in the entire group. These patients were largely unselected in contrast to the irradiated patients of Simpson and Hempelmann who all had an enlarged thumus. In the Pittsburgh study the irradiation port was also smaller resulting in a smaller area of irradiated tissues.

Saenger[28] has made an extensive study in 4 Cincinnati hospitals attempting to follow every child under 16 years of age who received X-ray therapy to the neck in an 18 year period. Eleven of the children have developed thyroid carcinoma, whereas none have appeared in their non irradiated siblings. Winship and Rosvoll[29] and Nishiyama et al [30] have also reported recent studies linking carcinoma of the thyroid in children with prior irradiation.

B. ADULTS

In contrast to the growing literature implicating radiation and subsequent thyroid carcinoma in children, there is a paucity of information available for adult populations who were irradiated either during childhood or adulthood. Patients receiving head, neck and chest irradiation during adolescence and adult years for varying reasons as well as patients receiving I^{131} will have to have prolonged follow-up if valid data are to be collected on older age groups.

As early as 1949 there was concern over the possibility of late radiation changes in the thyroid leading to malignant degeneration. At that time the only adult patients available for study were those who had received external roentgen ray treatment for hyperthyroidism. Quimby and Werner[31] in a letter to the Journal of the American Medical Association reported on the results of a questionnaire they had sent to 70 radiologists and 31 thyroid specialists. It is of interest that 10 cases of carcinoma of the thyroid were reported in patients who had previously received treatment with roentgen rays for hyperthyroidism.

Kilpatrick, et al in 1957[32] reported their findings on 100 cases of thyroid carcinoma from the Sheffield National Center for Radiotherapy. Only eight of their patients were less than 35 years of age at the time of diagnosis. In three there was a history of previous radiation to the neck for benign conditions. Wilson[33] reporting in detail the 3 cases of Kilpatrick and 4 additional adult patients who developed thyroid carcinoma following irradiation, noted that in only one instance had a patient been irradiated beyond the age of 16. The latent period in this instance was 37 years. In his discussion he mentions that the latent period in adults is frequently longer than that seen in carcinoma following radiation in children and quotes the British Medical Research Council in 1956 as saying it may be at least 20 years.

Willis in 1959[34] reviewed 104 cases of carcinoma of the thyroid at Queens University in Belfast. Three patients were found who had received X-ray therapy for thyrotoxicosis at ages 29, 26 and 63. They developed thyroid carcinoma after latent periods of 30, 21 and 16 years respectively.

Hanford, Quimby and Frantz[35] have reviewed all patients receiving therapeutic irradiation for non malignant disease of the cervical region in the Presbyterian Hospital from 1920 to 1950. Three groups of patients were studied including those with an enlarged thymus, toxic goiter and tuberculous adenitis. Seven cases of thyroid carcinoma were found in the irradiated tuberculous adenitis group. Although three were irradiated at age 15 years or younger, the others were in the 18-34 year age group. The authors stress the point that the doses of X-rays were not large (about 100 to 1600 r) and there was suggestive evidence that smaller doses may be somewhat more influential in predisposing to cancer than are large ones.

Studies at the Atomic Bomb Casualty Commission in Hiroshima, Japan, have been of interest as a fixed population sample is available for study following a single dose of ionizing irradiation. In the first 16 months of the Adult Health Study initiated in 1958 carcinoma of the thyroid was reported in 12 patients by Hollingsworth, Hamilton, Tamagaki and Beebe.[36] Eight of this group were exposed to the A-Bomb at a distance of less than 2000 meters. Three additional patients were studied who were known to be exposed at distances of 900, 1500 and 1900 meters from the hypocenter. They are not part of the fixed epidemiologic sample, but do represent patients known to have developed carcinoma of the thyroid following irradiation.

Socolow et al[37] have extended the Atomic Bomb Casualty Commission findings through 36 months (1958-1961) and included patients from Nagasaki as well as Hiroshima. In all, 21 patients with carcinoma of the thyroid have now been reported, 16 of whom were exposed within 2000 meters of the hypocenter.

Since the use of I^{131} for thyrotoxicosis in 1943, not a single case of carcinoma of the thyroid has been reported. In 1953 Dobyns, Vickery, Maloof and Chapman[38] reported a ten year follow-up on 400 patients who had received treatment with I^{131}. No cases of thyroid carcinoma were found in the group.

Lindsay et al[39] reported in detail the histologic effects af various types of ionizing radiation on normal and hyperplastic human glands. Ten of 24 hyperthyroid patients treated with I^{131} showed changes of Hashimoto's thyroiditis which the authors attributed to irradiation, suggesting that damaged thyroid cells decreased thyroid hormone production subsequently resulting in excessive TSH stimulation. No malignant thyroid neoplasms were found following any type of irradiation. However, three hyperplastic glands were described as having multiple benign neoplastic nodules, and the authors point out the theoretical possibility of the eventual development of malignant lesions in the irradiated hyperplastic human thyroid gland.

Pochin[40] has stated that a toal of 18 cases of leukemia have been documented following I^{131} treatment of thyrotoxicosis. He has also reported 4 leukemias in 140 cases of thyroid cancer treated with I^{131}. In the cancer cases there was most likely a direct relationship with the therapy as the average dose was 735 mc. Statistically, at the present time, the incidence of leukemia in hyperthyroid patients treated with I^{131} does not exceed the expected number of cases in the general population.

IV. Conclusion

A review has been presented summarizing the current literature on the relationship of radiation and carcinoma of the thyroid.

There is increasing evidence to indicate that the thyroid gland of children and adolescents is particularly sensitive to irradiation. The latent period between irradiation and carcinoma of the thyroid may be quite long. Although a number of adult patients with thyroid carcinoma have been reported following total body and head and neck irradiation, there has not been a single case reported following I^{131} therapy for thyrotoxicosis.

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COUNCIL MEETING SUMMARY OF ACTIONS

October 23, 1963

I. Attendance

Present in addition to the Chairman, Dr. Martin, were: Drs. Pitock, Hess, Weise, Sr., Gardner, O'Connor, Grendon, Grant, Davis, Phillips, Shepard, Weber Jr., Ciccarelli, Seigle, Egan, Abbot, Spitz, Hastings, Scully, Dean. Also present: Mrs. Lindquist, Dr. Richards. Absent were: Drs. Gilman, Cullen, Goldberg, Wilson, Bradley, Hughes, Gevalt, Caplan, Medbury.

II. Routine Business

Approval Of Minutes

It was VOTED to approve the minutes of the meeting of September 19, 1963, as printed and distributed.

Life Membership

It was VOTED to approve the applications for Life Membership of the following eligible Active Members:

Edward N. DeWitt, Bridgeport (FCMA)
Louis P. Hastings, Hartford (HCMA)
Hubbard Lynch, Fairfield (FCMA)
Edith A. MacLeod, Niantic (NLCMA)
Alice E. Rockwell, Excelsior, Minnesota (FCMA)
Harry M. Tiebout, Greenwich (FCMA)

Exemption From Dues

It was VOTED to exempt the following members from payment of CSMS annual dues as follows and for the reason indicated:

Josephine M. Fuhrmann, Woodbridge (NHCMA)—1964—Postgraduate education
Delbert B. Smith, Wallingford (NHCMA)—1962, ½ year 1963—Military service
Floyde D. Roos, Middletown (MCMA)—1963—Postgraduate Education

Committee On Maternal Mortality And Morbidity

It was VOTED to accept, with regret, the resignation of Lewis P. James, Hartford, as a member of this Committee.

Committee On Postgraduate Education

It was VOTED to authorize the Committee to plan and conduct meetings of the Clinical Congress in 1964 and 1965, at a time and place chosen by the Committee, and to approve continuation of the present policy of the Council with respect to the honoraria and travel expenses of speakers participating in the Clinical Congress programs.

Committee To Study Perinatal Morbidity And Mortality

It was VOTED to accept, with regret, the resignation of Charles A. Murphy, Stamford, as Chairman of this Committee. Dr. Murphy will continue to serve as a member. It was further VOTED to appoint Samuel D. Rowley, Hartford, to succeed Dr. Murphy as Chairman of the Committee for the remainder of the year 1963-64.

Conference Committee With State Dental Association

It was VOTED to accept the decision of Edward T. Wakeman, New Haven, to decline appointment as Chairman of this Committee for the remainder of the year 1963-64. The General Manager was directed to correspond with the Chairman of the Dental Association's representatives on the Committee for the purpose of obtaining his views on the importance of the Committee and the function it is presently serving with respect to the participating organizations.

Student American Medical Association

It was VOTED to offer SAMA the opportunity to have the Society's staff address a mailing of SAMA brochures concerning "Individual Sustaining Membership" to CSMS members, the costs of shipping the brochures to and from Chicago to be borne by the Society.

Second AMA National Congress On Medical Quackery

It was VOTED to designate Max Caplan, Meriden, as the official representative of CSMS at this Congress, to thank Dr. Caplan for his willingness to undertake this assignment, and to request him to file a report on the Congress with the Council at a later convenient date. The meeting is scheduled to be held in Washington, D. C. on October 25-26, 1963.

Date Of Next Meeting

It was VOTED to hold the next meeting of the Council on Thursday, November 21, 1963.

III. Old, New And Special Business

Corporate Practice Of Medicine

David A. Grendon, Chairman of the Committee, made an interim report on the progress being made in obtaining legal advice in the matter of implementing the recommendation made to the Council at its last meeting. It is believed that the Committee's investigation of this matter will be completed in time to make a report and recommendations to the House of Delegates on December 11, 1963.

Connecticut Medical Service, Inc.

The Chairman read the letter which had been sent to Dr. Horton of CMS on October 1, 1963, reaffirming the Council's decision to refrain from participating in further joint meetings of the CMS and CSMS Liaison Committees until the present litigation between the two corporations has been concluded.

The General Manager reported that Wiggin and Dana expected to have their first brief ready for filing with the court in the near future.

Meeting Of AMA House Of Delegates

It was VOTED to instruct the CSMS Delegates and Alternate Delegates to the Interim Meeting of the AMA, Portland, Oregon, December 1-4, as follows:

1. That our Delegates support, in accordance with their best judgment, a resolution being submitted by the Maryland Medical and Chirurgical Society which calls for a careful review by the AMA of its policy toward "bricks and mortar" federal assistance to medical schools, hospitals and other categories of medical facilities.
2. That our Delegates "do all possible" to support a resolution adopted by the Connecticut Society of Pathologists which "deplores the procedure of permitting the Carnegie Institute of Cleveland or other educational institution offering non-approved courses in medical technology to utilize an AMA convention for the dissemination of literature" and asks that the House take steps "to prevent any repetition of such a procedure."

New England Physicians' Retirement Program

M. David Deren, Bridgeport, who serves as chairman of the Committee on Medical Economics and Insurance of the Council of New England State Medical Societies, joined the Council and presented a comprehensive review of the retirement and insurance programs now being offered by NEPRP under the sponsorship of the New England Council. Members of the Society will receive brochures about the plans available through this agency which will allow physicians to take advantage of the provisions of HR-10 (the Keogh Law).

Committee On Preliminary Study Of Censorship Questions

1. In the case of Thau vs. HCMA, it was VOTED to direct the Chairman to write a letter of thanks to the President of HCMA for his letter of October 11, 1963 and to inform him that the Council considers this case to be closed. It was further VOTED to direct Michael R. Scully, Chairman of the Committee, to return all pertinent files which are the property of HCMA, to the HCMA office.
2. A letter was received from the appellant in an appeal hearing in which the Council had made rulings which absolved an FCMA member of wrongdoing, thereby sustaining the decision of the FCMA Board of Censors in this matter. The appellant requested the Chairman of the Council to initiate a further appeal on her behalf to the American Medical Association.

   It was VOTED to inform the appellant that, according to the CSMS Bylaws, decisions of the Council are final in cases of this kind and that, as far as CSMS is concerned, the case is closed permanently.

Communication—New London County Medical Association

The Council received as information the decision of the NLCMA Board of Censors that: "After review of the article and the editorial comments (of the Connecticut Chapter of AAGP), the Board of Censors finds no reason for taking action in this case, since no charges have been filed against (the physician named by the CCAAGP). As far as this County Association is concerned, the matter is closed." The CCAAGP has been sent a copy of this letter by the NLCMA.

Report Of The Chairman

Having been apprised by the General Manager that Benjamin D. Thaw, Hartford, was desirous of being replaced as Chairman of the Committee on Relative Value Study, Dr. Martin had taken it upon himself to discuss the matter with Dr. Thaw and was pleased to report to the Council that the latter had expressed his willingness to continue as the RVS chairman, providing the Council approved of certain recommendations which he planned to make regarding the last phase of the Study. The Chairman of the Council was directed to invite Dr. Thaw to join the Council, in person, at such time as he has recommendations to present.

Renewal Of The General Manager's Contract

A Subcommittee of the Council, consisting of the Chairman, the President, the Secretary and the Councilor from the Middlesex County Medical Association, made recommendations concerning renewal of the General Manager's contract as follows:

1. That on May 14, 1964, the termination date of his present five-year contract, the General Manager's contract be renewed for another five year term.
2. That, starting on the renewal date, May 14, 1964, an adjustment be made of his annual salary.

It was VOTED to adopt these two recommendations of the Subcommittee.

Report Of Delegate To New Hampshire Medical Society

Howard K. Ente, Westport, filed a report with the Council on his attendance at a meeting of the New Hampshire Society from September 19-22, 1963 at Bretton Woods, New Hampshire. In addition to recounting the general activities of the meeting, Dr. Ente made special mention of the following:

1. A statement by the President of NHMS, titled: "A Positive Approach to Medi-Care." It was VOTED to publish this statement in Connecticut Medicine, as suggested by Dr. Ente.
2. Remarks concerning the entertainment by medical societies of visiting delegates representing other medical societies. It was VOTED to direct the Chairman to appoint a subcommittee of the Council to develop a plan of reception and hospitality for the delegates and wives of delegates from other medical societies who attend the annual meetings of CSMS, and to report such a plan to the Council.

    Morris P. Pitock, Bridgeport, Chairman
    Stewart P. Seigle, Hartford
    Clifford E. Wilson, Norwich
    E. Tremain Bradley, Norwalk
    William R. Richards, New Haven, ex-officio

Adopting Dr. Ente's report as a whole, it was VOTED to commend him for its excellence.

1963 Semi-Annual Meeting Of House Of Delegates

It was VOTED to accept, with pleasure, the invitation of the New London County Medical Association to hold the semi-annual meeting of the CSMS House of Delegates at the Norwich Inn, Norwich, on Wednesday, December 11, 1963.

Report—Ad Hoc Committee On Committee And Staff Structure

Orvan W. Hess, the Secretary, reported for this Ad Hoc Committee (as its Chairman) and it was VOTED to adopt the report with its recommendations on the following five matters:

1. The General Manager's Office
2. Divisional Board and Committees
3. Connecticut Medicine
4. The Public Relations Department
5. Continuation of the Ad Hoc Committee

It was further VOTED to place on the agenda for the next meeting an item concerning plans for implementing the several recommendations contained in the Ad Hoc Committee's report adopted at this meeting. There seemed to be agreement that the Secretary and the General Manager should prepare this agenda item for Thursday, November 21, 1963.

N.B.: *The foregoing is a summary of the proceeding and actions of the Council on October 23, 1963. Detailed minutes of the meeting are on file at 160 St. Ronan Street, New Haven, for perusal by any interested member of the Society.*

NEW MEMBERS

Litchfield County
Donald A. Braisted, Sharon

Middlesex County
Anthony H. Axiotis, Portland
William M. Donnelly, Jr., Middletown
John W. Paardenkooper, Moodus

New Haven County
Irwin W. Abrahams, Meriden
John B. Berte, Hamden
Hubert B. Bradburn, New Haven
Charles R. Brinkman, III, New Haven
Rocco Cornacchia, Naugatuck
Michael DeNicola, Prospect
Roger K. Gilbert, Waterbury
Jacob Goldstein, New Haven
Henry J. Grycz, Cheshire
Edward T. Hare, Jr., Milford
Gerald Labriola, Naugatuck
Nicholas Livrieri, New Haven
Bernard Lytton, New Haven
John C. Mall, Wallingford
Carter L. Marshall, New Haven
John A. Muccino, Waterbury
Robert I. Schrier, New Haven
Bernard S. Siegel, New Haven
Bernard Snow, New Haven
Terry A. Terzakis, New Haven
Romeo A. Vidone, New Haven

Windham County
Kyong S. Cho, Putnam
Romain P. Goyette, North Grosvenordale
Sowhey Park, Putnam
John J. Vagell, Jr., Storrs
Morris B. Whitman, Storrs

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A POSITIVE APPROACH TO MEDI-CARE

William H. Gifford, M.D.
Colebrook, New Hampshire

(Dr. Howard K. Ente of Westport, CSMS Delegate to the New Hampshire Medical Society, heard this article presented orally to the House of Delegates of the New Hampshire organization by its president on 9/22/63. At Dr. Ente's suggestion, it is published in Connecticut Medicine *so that our Members may give consideration to the points of view expressed by the author.)*

> *We look too often to Washington for the solution to our problems.*
> —Dwight D. Eisenhower.

■ During the past few years, many arguments have been waged on plans for medical care for the aged. These have ranged from complete coverage for everyone (regardless of whether they needed it or not) to medical care for the strictly indigent.

Medicine and politics both agree the problems exist, but the solution has been nebulous for a variety of reasons. Many of these reasons hinge on RIGHTS. The body politic believes it has rights to determine what is best for the people. Medicine finds its rights in jeopardy in the field of treatment and in personal evaluation of services rendered. But . . . what of the rights of the patient? The right to plan his own future . . . the right to his self respect . . . his right to go where he wants for his medical care . . . to choose the physician of his choice . . . yes . . . the right to care for himself in his old age and the right to spend the money he earned as he wishes. Under government plans with social security, the patient's money is *taken* away from him. The government . . . our government has the unmitigated conceit to believe it can plan our lives and spend our money more wisely than we ourselves can do.

No one in his latter years wants a handout from the government, yet everyone at that time of life wants and needs security. A plan is needed that safeguards the citizen's rights and self-respect by encouraging him to be self-reliant in his earlier years. The Australian Government rewards such a man (in his medical care) by subsidizing him in proportion to the extent to which he helps himself. Such a plan must maintain as much personal freedom of the citizen as is possible, and give little or no control to the government. Such a plan must guarantee maximum security for the aged, with the minimum loss of dignity consonant with the operation of the plan.

A brief survey of plans now in existence reveals a variety of mechanisms which range all the way from matching Federal Funds of the Kerr-Mills Bill (with its means test) and OAA, to prepayment voluntary health insurance and employer-employee matching funds in many of our industrial health plans.

In an attempt to offer something positive the following plan has been conceived as a possible solution. Briefly stated it is as follows:

The worker (who in many industries at present is *voluntarily* participating in an employer-employee matching fund health plan) agrees *voluntarily* to have a small, additional sum deducted from his salary as it would be under Social Security, *BUT* this sum is paid to a TRUST FUND of his choice. These trust Funds are set up by private enterprise, i.e., Insurance companies, banks, etc. Thus the worker becomes a partner in American Industry during his working years with a guaranteed security on retirement. This sum of money is deducted from the worker's paycheck for a period of 20 working years. This length of time is less than half the citizen's working span (age 20 to 65) and would allow adequate time for payments in case of illness. When he has paid in his 20 years premiums—his TRUST FUND notifies him and his payments cease.

At age 65 or at such time as the worker becomes totally disabled, the trust fund pays to the insurance carrier *of the patient's choice,* the premium of his health insurance matched by Government funds. The worker's spouse and dependent children would be covered by this policy even after the worker's death until the children have reached their majority and/or the spouse has remarried. Those not covered by this program who are indigent on reaching their 65th year or on becoming totally disabled would be supported as they are at present by local, state and federal funds. This latter group would be service contract—the former would be optional.

Can you imagine the effect this program would have on private enterprise? *Think* of what private enterprise could do with 20 years of premiums to invest and expand our economy. Capitalism would be given a new life by this monetary transfusion from its new "stockholders."

In return . . . did you ever see a stockholder who didn't have a sharp interest in "his company" regardless of how small the return? During his working years his deposits are paying him dividends . . . and that's more than social security does. During his working years as he makes his deposits . . . *reserves are being set up for him* . . . and that again is more than social security does. Finally, when he retires . . . he has a guarantee that his money will be there waiting for him . . . which is more than social security can do.*

This plan is not the total answer. There are many points that are negotiable.

Basically I believe it has merit. At least it is a far cry from the political hoax that is persistently being perpetrated on the American people under the guise of "social security." If we are to survive the government onslaught, we must realize that resisting socialization by defense tactics is hopeless . . . we must go on the offense . . . offer something positive and stand up straight. We have something to offer our people and it's time the government knew it. A plan such as this is more than security . . . it's a passport to security with freedom, security with dignity and he who carries the passport may travel to the end of his days and call his soul his own.

This rather crude plan has been left in its original concept to offer points for negotiation. It is not an "instant" solution, but as it is implemented and comes of age, the other plans now in existence which are "holding the fort" will die gracefully. It is my hope we will enter an era in which the nations of the world in search of new horizons will find Americans all ready there. They will ask, "How did they get there?" and the answer will come loud and clear, "They made it through great strides in stature when they stopped crawling in fear of their Government . . . when they realized they were the government . . . and that the fear was in themselves.

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* The Supreme Court has ruled that the Government's O.A.S.I. (Old Age Survivor's Insurance) program is not an *insurance* for the American people. It is a tax. Were it an insurance it would be unconstitutional since it *does not* set up reserves nor does it impose upon itself other safeguards it requires of private enterprise.

1963 MEETINGS

December 11—Semi-Annual Meeting, House of Delegates of the Connecticut State Medical Society, to be held at Norwich Inn, 607 W. Thames Street, Norwich, Connecticut, at 2:00 P.M.

1964 MEETINGS

March 19 — 180th Annual Meeting of the New Haven County Medical Association will be held at Waverly Inn, Cheshire, Conn. Business Meeting scheduled for 2:30 P.M.

April 28-30—Annual Meeting Connecticut State Medical Society, to be held at Statler-Hilton Hotel, Hartford.

May 25-27—Annual Meeting American Thoracic Society Medical Section of the National Tuberculosis Association to be held in New York City.

June 14-19—The VII Interamerican Congress of Cardiology will be held in Montreal, Canada.

June 21-25—Annual Meeting American Medical Association to be held at Fairmont & Mark Hopkins Hotels and Civil Auditorium, San Francisco, California.

PLACEMENT WANTED

The Society's Placement Service is in receipt of the following:

PHYSIATRIST—age 31—graduate of the Medical School of Tehran University, Iran. Interested in Physical Medicine and Rehabilitation.

David L. Lewis, M.D., age 31—M.D. University of Virginia School of Medicine. Specialty Orthopedic—available June 1964.

PLACEMENT OPPORTUNITIES

FAIRFIELD COUNTY. For Sale—ten year General Practice, fast growing community. Price includes home with attached equipped office. Centrally located.

OTOLARYNGOLOGY. In the Hartford area. Large practice and fully equipped office. Immediate hospital privileges available for qualified Otolaryngolist desiring to assume responsibility.

PEDIATRICIANS. Part time temporary for State Crippled Clinics, Norwich and Windham, monthly and Hartford Office two to four days per month.

HOUSE PHYSICIAN. Diversified duties in small accredited voluntary hospital. Connecticut license required, $15,000 year.

INTERNIST. Available in the near future, salaried position in combined tuberculosis and chronic disease hospital.

ANYONE INTERESTED IN THE ABOVE IS ASKED TO COMMUNICATE WITH THE GENERAL MANAGER'S OFFICE, 160 ST. RONAN ST., NEW HAVEN.

Chemotherapy For "Hopeless" Patients

No longer is it absolutely necessary for the physician to feel "hopeless" about the "hopeless." Through the use of drugs and psychotherapy, in many ways the physician now stands in relation to the mentally ill as he did when he first was confronted with the possibility of being able to manage and control the diabetic, cardiac, and epileptic better. He had much to learn about the use and abuse of insulin, digitalis, and the anticonvulsants as well as how to understand, relate to, and develop and maintain a continuity therapeutic relationship with those patients. The physician has done a magnificent job in these areas. These responsibilities have been incorporated into his bag of skills and he feels comfortable and competent with the load he carries. I predict he will, sooner or later, feel similarly about the mentally ill. — Leonard T. Maholick, M.D., Medical Director, The Bradley Center, Columbus, Georgia, to American Academy of General Practice, Chicago, April 1, 1963.

Good Library Services Save Money

The librarian's imagination is put to effective use only when it is supported by sufficient funds to bring ideas into reality. The medical libraries of pharmaceutical houses, for example, have exhibited greater sophistication in services generally than have the libraries of medical schools. The reason is that they are financially better supported. There are funds for more and better trained personnel, for mechanical devices to streamline routines, and funds simply to turn into action those ideas which will meet the assessed needs of the community to be served. The motivation in pharmaceutical houses is neither benevolence nor extravagance; it is simply a matter of economic self-interest. To them, cost studies have indicated that money spent in library services saves money elsewhere or makes money elsewhere. Surely, the urgency of research in a proprietary institution should be no greater than that in an academic institution—Harold Bloomquist, Assistant Librarian, Harvard University Schools of Medicine and Public Health, in *Journal of Medical Education,* March 1963.

ADVERTISE IN
THE
JOURNAL

Doctor's Office

Joseph E. Bouthillier, M.D., announces the opening of an office for the general practice of medicine at 36 Babcock Avenue, Plainfield.

Richard K. Himmelsbach, M.D., announces the opening of an office for the general practice of medicine at 932 Hopmeadow Street, Simsbury.

L. Robert Rubin, M.D., announces the opening of an office in association with Alvin Goldman, M.D., and Robert C. Joy, M.D., for the practice of pediatrics at 83 West Street, Danbury.

Alden Seleman, M.D., announces the opening of an office in association with Philip Brezina, M.D., for the practice of general surgery at 105 Woodland Street, Bristol.

W. Alan Shafto, M.D., announces the opening of an office in association with Peter C. Jameson, M.D., and Marjorie Shafto, M.D., for the general practice of medicine at 18 Fairview Avenue, Danbury.

Mary A. Tummillo, M.D., announces the opening of an office for the practice of internal medicine at 525 Windsor Avenue, Windsor.

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Letters To The Editor

To the Editor:

An old friend of mine has a saying I like, "We're too apt to put up monuments to the wrong people," meaning, of course, that the dedicated work of an unselfish few is really what preserves the structure we call civilization.

Surely many of us appear deaf to appeals which should stir us deeply and myopic to visions of the future which threaten our destruction.

It is not egoistic to suggest that medicine is a particularly privileged profession. But, every privilege carries a proportionate burden of responsibility. How many of us are meeting ours adequately in what is a very critical period of our professional existence?

We know that medicare is a misnamed and also a political football. We know that the projected program is only the first act, the foot-in-the-door. We should know that we need only do nothing, and our reward will be to awaken one day to find we have a group of hired men controlled by someone who happened to get elected or appointed the town dog-catcher. But many of us—most of us—snug and smug and reasonably prosperous are too busy playing golf or watching television to attend meetings which our colleagues have planned or too unconcerned to write a check for one per cent of our income—or a tenth of one per cent!

This letter started out to be a tribute to our General Manager for his exceptional energy and his devoted work in our campaign for self-preservation. Few of us have less to gain than he from the success of this campaign which now shows some promise of success. None of us has done as much as Bill Richards to protect our rights and preserve our status. Bill isn't shopping for a monument, but I'm sure that more of us should let him know we are with him. We owe it to him to give him a greater demonstration of our support and some sign of our gratitude. He's good, but he's human.

Sincerely,

Ellwood C. Weise, Sr., m.d.

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HARTFORD NEW BRITAIN

To the Editor:

On the President's Page of the last issue of Connecticut Medicine Dr. Pitock admired the "Statement of Principles" he heard delivered by the impressive, ascetic-looking, young orator, Congressman Bruce of Indiana who "in all modesty" claimed no "originality in enunciating his principles . . . (and) . . . gives due credit to the 'Beaver County (Pennsylvania) Times,' in which an editorial . . . first expressed these truths so well." These truths are also quoted word for word in Current Medical Digest, September 1963, page 35, and are attributed to Abraham Lincoln who, I'll bet, did not sound half as good. Oh well, the Principles are still OK.

Sincerely,

Gilbert J. Rose, m.d.

Norwalk, Conn.

This letter was brought to the attention of Dr. Pitock, who states as follows:

To the Editor:

I can only surmise that the author, like myself was present at the A.M.A. Meeting in June when Congressman Bruce pronounced his "Statement of Principles" and was equally impressed with it. In the spirit of Dr. Rose, I have no objection whatever to as wide spread distribution with these principles as possible. I do make every effort to make the subject matter of my President's Letter as topical as possible.

Very truly yours,

M. P. Pitock, m.d.
President,
The Connecticut State Medical Society.

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In Sprains, Strains and Muscle Spasm, 'Soma' Compound

numbs the pain...not the patient

A potent analgesic and a superior muscle relaxant

1. A sprain or fracture is not a big clinical problem—but it does hurt. And if there is housework to do and kids to mind, the patient needs something to numb the pain.

2. A.P.C. compounds have limited usefulness; and the patient can buy them without your prescription. Unfortunately, most of them are too mild to be effective for sprains—and more potent products too often make the patient feel 'dopey'.

3. 'Soma' Compound is ideal in these cases. Since it contains both 'Soma' (carisoprodol) and acetophenetidin it is both a potent analgesic and a superior muscle relaxant; it also contains caffeine to offset any drowsiness *("numbs the pain...not the patient")*.

4. Why not try 'Soma' Compound? Dosage is 1 or 2 tablets q.i.d. For more severe pain, try 'Soma' Compound + Codeine. Dosage: 1 or 2 tablets q.i.d.

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THE ALFRED L. BURGDORF, M.D. MEMORIAL FUND

During the summer months of 1963, a group of friends and colleagues of Dr. Alfred L. Burgdorf met in order to organize a memorial fund effort, the object being to perpetuate his name and fields of interest that characterized him as a physician and humanitarian. A Committee was organized which is now composed of forty prominent professional and lay persons in the Greater Hartford Area. After several meetings this group proposed the following actions:

1) To cast a bronze bas-relief tablet with a portrait of Dr. Burgdorf thereon to be affixed to the Hartford Health Department building indicating its official renaming by the Court of Common Council, City of Hartford, to: "The Dr. Alfred L. Burgdorf Health Center." The tablet, itself, will read as follows:

   "Dr. Alfred L. Burgdorf Health Center
   Director of Health, City of Hartford
   1940 - 1962
   Physician — Humanitarian — Dedicated
   Public Servant — Champion of Human Welfare

   In recognition of his untiring efforts and devotion to the health and welfare of our citizens. For his dedication and constancy in guarding against the advance of disease. And for those beloved qualities of leadership that inspired and stimulated all who knew him toward the betterment of our community."

2) To provide funds for an annual memorial lecture in public health and preventive medicine.

3) To provide funds for the annual purchase of texts, periodicals and other subscription literature in public health and preventive medicine.

4) Any additional monies to be allocated to needy and deserving students in the ancillary health services (nursing, medical technology, dental hygiene).

Dr. Burgdorf was a native of Meriden, Connecticut; graduating from Rush Medical College in 1932, and Johns Hopkins University, School of Hygiene and Public Health. In 1935, he joined the Connecticut State Department of Health after serving in Alaska as a physician in the Bureau of Indian Affairs. In 1940, he was appointed Director of Health, City of Hartford. Dr. Burgdorf was an active member of the Hartford County Medical Association and the Connecticut State Medical Society.

All of the members of the medical profession are being asked to contribute to this fund. Those wishing to do so may make checks payable to:

The Alfred L. Burgdorf, M.D. Memorial Fund
c/o Milton H. Glover, Fund Treasurer
Hartford National Bank & Trust Company
36 Pearl Street, Hartford, Connecticut

News From Yale University School Of Medicine

Dr. Grover Francis Powers professor emeritus of pediatrics at Yale, is one of six leaders in the field of mental retardation to receive the second annual International Award of the Joseph P. Kennedy, Jr. Foundation.

Dr. Powers is being honored for "his multiple capacities as an acute investigator of mental defects, a teacher of doctors, a dedicated leader in organizing services in favor of the retarded and a counselor of parents of retarded children."

He is a native of Colfax Indiana and was graduated from Johns Hopkins University with a degree in medicine. He was assistant in pediatrics at Yale's School of Medicine from 1921 to 1924, an associate professor from 1924 to 1927, and from 1927 to 1952, a professor and chairman of that institution's department of pediatrics.

Dr. Charles Davenport Cook, Associate Clinical Professor of Pediatrics at Harvard University Medical School and an authority on respiratory diseases of infants and children, has been appointed Professor and Chairman of the Department of Pediatrics at the Yale School of Medicine, succeeding Dr. Milton J. E. Senn, Sterling Professor of Pediatrics and Psychiatry, who also is Director of Yale's Child Study Center. Dr. Senn is retiring as department chairman—a post he has held since 1951—to devote his full time to direction of the Child Study Center.

Besides his Harvard teaching duties, Dr. Cook also has been Chief of the Medical Out-Patient Department at the Children's Hospital Medical Center in Boston since 1954.

His major field of research interest is children's respiratory diseases and adaptations of the respiratory system at birth, particularly the study of hyaline membrane disease of the lungs of newborn infants. This disease is one of the most common causes of death in premature infants.

Dr. Cook will continue his work in this area at the Yale-New Haven Medical Center, which has a large premature and newborn infant service. He also will be studying the so-called collagen group of diseases, which includes arthritis and scleroderma, a usually-fatal hardening of the skin in premature infants.

Special Notices

SECTION OF INTERNAL MEDICINE

A Section of Internal Medicine of the Connecticut State Medical Society has recently been organized. Inquiries concerning membership should be addressed to Robert J. Molloy, M.D., Secretary-Treasurer, 106 Gillett Street, Hartford 5, Connecticut.

HAHNEMANN MEDICAL COLLEGE AND HOSPITAL CARDIOVASCULAR DRUG THERAPY

Motor Hotel, Philadelphia

January 20-23, 1964

The purpose of this symposium is to evaluate the current cardiovascular armamentarium. The rationale and drug spectrum of antihypertensive drugs, antianginal compounds. diuretic agents, vasopressors, anticoagulant and antirrhythmic drugs and cardiotonic compounds will be explored in relation to their clinical pharmacologic application.

AMERICAN COLLEGE OF ALLERGISTS

March 1-6, 1964

American College of Allergists Graduate Instructional Course and Twentieth Annual Congress, March 1-6, 1964, The Americana, Bal Harbour, Miami Beach, Florida. For further information write: John D. Gillaspie, M.D. Treasurer, 2141 14th Street, Boulder, Colorado.

In Memoriam

Bevans, Theodore F.—Waterbury, University of Minnesota Medical School, 1903. Dr. Bevans also studied in London and Paris, and at the May Clinic before coming to Waterbury in 1907. Dr. Bevans was an eye, ear, nose, and throat specialist in Waterbury and attending ophthalmologist at the Waterbury Hospital for 50 years. During World War I, he served as a captain in the Medical Corps of the United States Army. Dr. Bevans was a 50-year member of the Connecticut State Medical Society and was so honored in April of this year. He was also a member of the American Medical Association, the New Haven County Medical Association, the Waterbury Medical Association, and the American College of Surgeons. Dr. Bevans died October 13, at the age of 87.

NEW BOOKS IN REVIEW

CROSSEN'S SYNOPSIS OF GYNECOLOGY. Sixth Edition. Authors: Daniel Winston Beacham, M.D. and Woodard Davis Beacham, M.D. Publishers: The C. V. Mosby Company, St. Louis, Missouri, 1963, 371 pp. $7.50.

Reviewed by: ORVAN W. HESS

This book is the Sixth Edition of a synopsis of gynecology by Drs. D. W. and W. D. Beacham. As indicated in the preface of the First Edition by the original author H. S. Crossen, M.D., this publication is primarily a concise summary of basic essentials for the student and nonspecialist. As such, it has served a useful purpose for several generations of doctors as a guide to the diagnosis and treatment of common gynecological disorders. The material describing methods of physical diagnosis is very well presented in considerable detail. The relationship to rational therapy is outlined in an orderly manner. The illustrations are excellent. New material has been included concerning advances in physical and laboratory technics. This includes information concerning chromosomal counting for sex determination, induction of ovulation with human pituitary extracts, septic shock due to endotoxins, and other new developments.

This excellent pocket-sized edition is highly recommended for students and general practitioners who have an interest in the specialty of gynecology.

CLINICAL ANATOMY by Otto C. Brantigan, M.D., F.A.C.S. Illustrated by Thomas Stevenson, The Blakiston Division, McGraw-Hill Book Company, Inc., New York, Toronto, London, 1963, 421 pp. $15.00.

Reviewed by: JAMES R. CULLEN

The above described text is one of descriptive and diagrammatic anatomy, is well written, clear, concise and based upon sound anatomical principles. The included illustrations, presented in a simplified diagrammatic fashion, are easily understood and clear.

As stated in the author's preface, the reason for this book is to bring to the practitioner an understanding of the broad aspects of anatomy as it applies to diagnosis and treatment. I feel he has accmoplished this end rather well.

The organization of the text is well done. For example, the first chapter dealing with surface anatomy as related to underlying structures, is followed immediately by a chapter on various needling procedures (i.e. from nerve blocks to pericardiocentesis inclusive). These procedures become very clear and understandable with a knowledge of surface anatomy, and should be extremely useful to all physicians.

The following chapters include sections on incisions, the fascia, abdominal hernias, extremities and fractures, the peritoneal cavity, the pelvis and perineum, the thorax and the head and neck. All are well treated.

Of especial significance are the chapters on collateral circulation and lymphatic drainage; these are well done, soundly written, simply diagrammed and always with a clinical tone.

One may initially have difficulty becoming accustomed to the diagrammatic illustrations, especially if unfamiliar with the region in question. However, the clarity and soundness of the presentation will soon overcome this problem.

The text will surely be of value to practitioners of medicine and also a welcomed companion to other textbooks of anatomy.

HANDBOOK OF THE PRACTICE OF ANESTHESIA. By John R. S. Shields, M.B., Ch.B., F.F.A.R.C.S., Associate Professor of Anesthesiology, Department of Surgery, Washington University School of Medicine, St. Louis, Missouri. The C. V. Mosby Company, St. Louis, 1963, 192 pp, $6.85.

Reviewed by: JOHN D. MURPHY

Dr. Shields states in his preface, that no attempt is made to present detailed aspects of physiology and pharmacology as related to anesthesia. Rather, he has attempted to assemble a series of practical do's and don'ts, reflecting in great measure, the author's point of view in the practice of anesthesia.

The contents of the book are divided into five parts, consisting of preoperative considerations, general anesthesia, special techniques (including conduction anesthesia), unusual problems associated with surgical procedures or associated patient diseases, and lastly, post-operative care including a brief resume of fluid problems by Dr. Harvey Bernard.

An attempt is made throughout the book to touch upon all the important facets of anesthetic practice. However, the author falls short in some of his efforts. The volume contains a little bit about many subjects (e.g. relaxants, hypothermia, cardiac catheterization, bronchoscopy), but delves into none very deeply. As a result, it would not appear to be of particular value to the beginner in anesthesia because of the paucity of fundamental pharmacophysiological principles, as well as the brevity of information on the mechanics of anesthetic techniques. For instance, none of the commonly used inhalation agents are listed in the index, and mention of them occurs only sporadically throughout the text. The sections on regional and obstetrical anesthesia are skimpy.

The first section of the book is devoted to a cursory review of preanesthetic evaluation and pre-operative medication. The second section entitled "General Anesthesia" discusses primarily the techniques of intravenous and inhalation anesthesia with deemphasis of agent choice. The chapter on endotracheal intubation is probably the best in the volume. There is a short section on basic monitoring systems. The third section includes chapters on conduction anesthesia, pediatric problems and hypothermia. The newborn infant and surgical correction of some common congenital defects is well treated. Section four is devoted to the anesthetic management of various surgical procedures, and includes a chapter on the complications inherent in a handful of the less common diseases (pheochromocytoma, myasthenia gravis and Addison's Disease). The chapter on cardiac collapse and resuscitation is presented in a perfunctory manner. The book concludes with a section on fluid balance, a limited bibliography, and an index which is not well organized.

The handbook is presented in very elementary fashion with many shortcomings. The errors of omission, however, outweigh by far those of commission. There is, however, a serious typographical lapse on page 74 concerning the intravenous dosage of Isuprel and aminophylline.

Although the author would tend to be dogmatic in his content, he is terse and succinct in his expression. The book is profusely illustrated with 113 figures within 192 pages of text. There is considerable wasted space between chapters and on several of the pages depicting the line drawings. The binding is secure and the print easily readable.

TODD-SANFORD CLINICAL DIAGNOSIS BY LABORATORY METHODS. Edited by Israel Davidsohn and Benjamin B. Wells. W. B. Saunders Company, Philadelphia, Pennsylvania, 1962, 1020 pp.

Reviewed by: LOUIS H. NAHUM

For the first time in fifty-five years, since its first edition, this book is a work of multiple authorship, a fact which reflects the rapidly expanding scope of clinical pathology. There are numerous topics of compelling practical applications. Hematology, microbiology, and clinical chemistry have each been greatly expanded each in a series of chapters. Immunology helps understand old pathogenetic puzzles and as a practical diagnostic tool and a guide to therapy is brought up to date. Water and electrolytes, microbiological techniques in pediatrics, tests of hepatic functions, serum enzyme determinations, laboratory tests aiding in diagnosis of pancreatic disorders are all thoroughly covered.

For the first time there appears chapters on statistical tools in clinical pathology, isotopology, hospital epidemiology, space and equipment needs in a modern clinical laboratory. In short, this book is a completely rewritten text. At the end is appendix I on the clinical pathological laboratory. Appendix II contains culture media, strains, reagents and techniques. Appendix III is devoted to physiologic solutions buffers, acid base indicators, weights and measures with equivalents. Appendix IV offers tables or normal values.

There is no doubt that multiple authorship has its overwhelming advantages. Nevertheless to make the book of uniform excellence. there must be exercised tight editorial control, otherwise there is bound to develop differences in the quality and orientation of the chapters and even wrong references. For example, page 207, column 1, under relation of the hypophysis and adrenals to leucocytes, data attributed to Dougherty et al are correctly described, but reference is to the wrong paper by these authors. On page 387 and 388 we find methods of mixing test tube contents which could only be aimed at a high school student who has never been in a laboratory. Then there is a figure of a slide rule which is illegible and without instructions in its use.

Nevertheless, the authors have carried out well the philosophy of Todd and Sanford. They understand what they want to achieve and have succeeded in transmitting the knowledge to the readers. They are sensitive to the rapidly changing demands of medical practice and have produced a book in which there is something for everybody working in

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Editor and Major Contributor, Charles Wesley Shilling, M.D., D.Sc., Consultant to the United States Atomic Energy Commission; Deputy Director, Division of Biology and Medicine, USAEC, 1955-60. With the Assistance of Miriam Teed Shilling, M.A. Prepared under the auspices of the Division of Technical Information, USAEC. 474 pages, 7¼″ x 10¼″, with 268 illustrations, 98 tables. About $10.50. *New—Ready January!*

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the field and everyone who recognizes the indispensable position of the laboratory in the practice of modern medicine. Accordingly, it will be of help to everyone working in a laboratory and to every physician who needs laboratory aids in his practice.

BIOPHYSICS OF PHYSIOLOGICAL AND PHARMACOLOGICAL ACTIONS by Abraham M. Shanes, Editor. American Association for the Advancement of Science, Washington, D. C., 1961, 612 pp. Regular price $13.50, prepaid to A.A.A.S. members $11.75.

Reviewed by: LOUIS H. NAHUM

This excellently arranged symposium presents a birds-eye view of excitability and permeability as they apply to a variety of excitable systems such as nerve, voluntary muscle and membrane contraction coupling, functional transmission, contractile properties of voluntary muscle and involuntary muscle of which the heart cell is just one.

Most of the contributions could not have been made had it not been for the development of specialized techniques, such as the voltage and current "clamp" techniques and radioisotope techniques. From these we have learned that the passage of ions through membranes under the influence of electrochemical forces is a very complex affair. We have learned that an appreciable amount of ion transfer is directly coupled to the energy turn over in cells. Finally, we have learned that the contractile process is linked to cellular electrochemistry.

This subject is one exciting borderline frontier of biological sciences. The studies have been made on frog skin, the erythrocyte, the giant axon of the squid and single muscle fibers. But the results are bound to illuminate the physiology of less accessible systems such as small myelinated and unmyelinated nerve fibers, various muscle fibers and heart and smooth muscle cells.

Numerous drugs as well as naturally occurring agents of interest to the pharmacologist have served as patent tools for probing the processes involved. This has had the inevitable result of increasing our understanding of the role of pharmacological and physiological substances. Since life depends upon cardiac rhythmicity and contractility, upon nerve impulses uniting all the activities of our organs, upon smooth muscle contraction in gut, ureter, blood vessel and much more, it is clear why a basic understandling of how these units function, must contribute to our mastery of them in health and disease. This reviewer has been interested in why depolariation of a muscle cell membrane is followed by contraction. An excellent account of this basic process by Saul Winegrad in his paper on electrolytes and contractility in heart muscle presents work on the role of the calcium ion in the coupling of electrical with the mechanical aspect of contraction. Properly applied this knowledge will play an important role in open heart surgery.

It is a fascinating book for basic physiologists and pharmacologists, students interested in the basic sciences, and teachers. It will be too technical for practitioners of medicine.

We are indebted to the Division of Research Grants and Fellowships of the National Institutes of Health for the financial support of this symposium.

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PRINCIPLES OF INTERNAL MEDICINE, by Editors T. R. Harrison, Raymond D. Adams, Ivan L. Bennett, Jr., William H. Resnik, George W. Thorn and M. M. Wintrobe. 4th Edition. The Blakiston Division, McGraw-Hill Book Co., Inc., New York, 116 contributors, 1947 pages with an index of 75 pages. $19.50.

Reviewed by: LOUIS H. NAHUM

The monumental text of 1947 pages shows drastic revisions from the edition of four years ago and expresses the revolutionary changes that have occurred in the science of medicine in the last decade. Genetics and disease by McCusick (Chapter 46) reflects in its expansion the enormous importance this discipline has acquired in the last few years. Section 5 on Errors of Metabolism is up to date compared to the 3rd Edition. A chapter has been added on air travel. A valuable introduction and a drastically reworked chapter on viruses with more discrete headings of enteric viruses, viral eye diseases, viral diseases affecting lymphoid tissue etc. is extremely valuable. In other words this text is abreast of scientific progress upon which medical teaching must be based. In this sense it contains the "why" of disease.

Clearly the authors who wrote the various sections and particularly the editors have a special philosophy which is detectable in every page. It involves a high sense of responsibility towards patients and a sensitivity to the significance of illness. In Part I, the physician and the patient, is summarized the views concerning the attitudes and obligations involved in this relationship.

It is only through unravelling the basic mechanisms of disease that progress in medicine has taken place. To understand the mechanisms requires knowledge of both structure and function in other words integrating the preclinical sciences into clinical medicine. And so we find throughout, the meaning of symptoms, because they give the initial clue to the nature of the disease process. The search for the underlying disease is thereby facilitated and the recognition of a clinical pattern emerges.

There is a tendency in this volume to discuss syndromes because many dissimilar diseases have features in common and from this vantage point, the characteristics of a particular disease emerges, and the diagnostic and therapeutic problems common to a number of diseases and their treatment is more easily arrived at. Thus for example management of refractory, renal or cardiac failure can often be considered best when these conditions are approached as syndromes rather than specific diseases. Nevertheless unless the etiology is also considered and recognition of removable causes identified, the syndrome management is only partially successful.

Part III is calculated to bring to the physician the practical benefits from advances in the biologic sciences. Broad principles of genetics, of electrophysiology and of the regulation of the internal environment are taken up. The theoretical basis of the electrocardiogram is however so abstract as to have little value to the physician particularly, because it is all based upon the vector concept which probably does not hold in electrocardiography except in a didactic way. And also because its validity in clinical interpretation is not brought out.

This book has something for everyone and everyone needs to use it. The student of the first and second year will find

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fascinating reading in part II in which the relation of basic science to clinical medicine is outlined. This is also valuable to the preclinical teacher who must arouse the students interest in the meaning of his science since they are the basic principles for a clinical framework.

The third year student with his first patient will find discussed the specific diseases and syndromes that apply in his patient. He will also need to go back and study again the mechanisms of disease which his patient presents. The fourth year student, the clinical teacher, the young physician will if they use this book as a text grow in clinical maturity. It will mean an educational process involving principles, understanding of functional distortions which produce clinical phenomena, common manifestations of the more important mechanisms of disease and treatment.

In short the book will be helpful to all engaged in studying or practicing medicine especially when an unfamiliar manifestation or disorders is encountered or when specific information about a disease or a new therapeutic procedure is desired. This text is a monument to scientific and schoraly excellence.

REVIEW OF PHYSIOLOGICAL CHEMISTRY by Harold A. Harper, Ph.D. 9th Edition. Lange Medical Publications, Los Altos, California, 1963, 437 pp. $6.00.

Reviewed by: LEONARD A. HOWARD

Dr. Harper's "Review of Physiological Chemistry" was first published in 1939 and has now been brought up-to-date in its 9th printing. This volume is a worthwhile edition to the library of every student and practitioner who is interested in basic physiological chemistry.

Dr. Harper divides the book into sections beginning with the primary carbohydrates, lipids and proteins, giving a concise description of the chemical interactions, metabolism, as well as qualitative tests for identification.

Using the basic above named substances as building blocks, the book then goes forward into the more complicated chemicals as found in the human body. These include the nucleoproteins and nucleic acids, the porphyrins and bile pigments, the vitamins and the enzymes. Each of these groups is discussed with a view to its practical importance.

The remainder of the volume goes forward into the action of the metabolism of the body using the afore-mentioned substances as points of reference. The chemistry of the blood as well as the chemistry of respiration and digestion is discussed clearly and at length. The metabolism of carbohydrates, fats, and proteins are clarified and are shown both in normal and abnormal conditions.

Detoxification, including tests of liver and kidney function, and excretion both via the G.I. tract and kidneys are clearly defined.

Water and mineral metabolism and their interplay with basic food products via the hormones are discussed at length. Finally, the elements of calorimetry are explored.

The volume is clearly written and easily understood by persons with only a rudimentary background in physiological chemistry. It is so designed as to be a ready reference for questions in this field which ordinarily provide a harassment to the busy practitioner.

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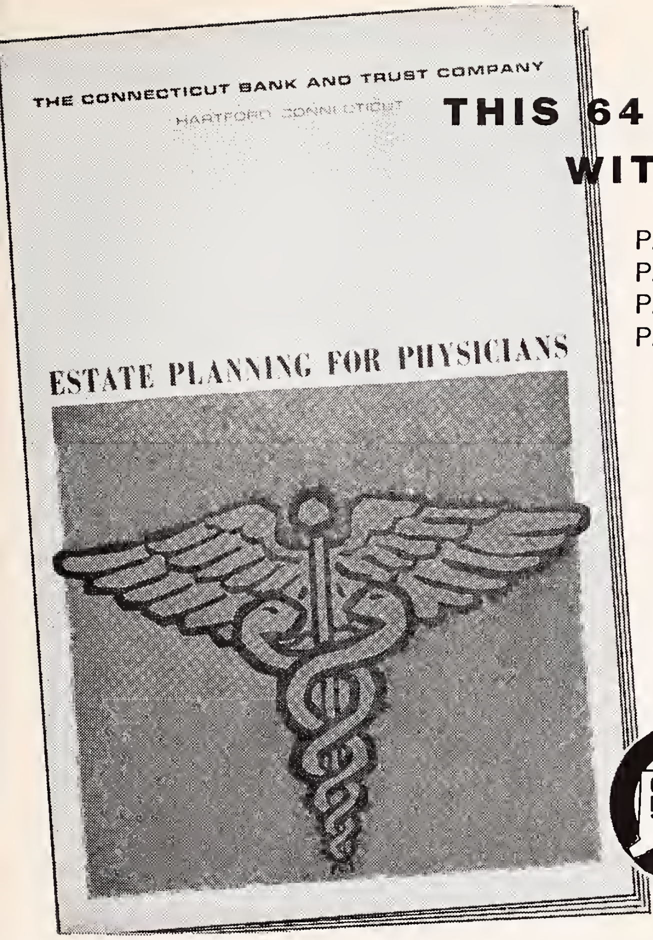
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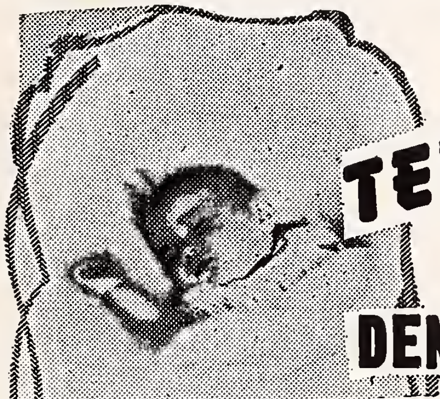
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References: 1. Hopen, J. M., and Campagna, F. N.: J. Philadelphia Gen. Hosp. **5**:20, 1954. 2. Lichtman, A. L.: Delaware M. J. **33**:11, 1961. 3. Lichtman, A. L.: Ann. New York Acad. Sc. **68**:196, 1957. 4. Golden, H. T.: Clin. Med. **2**:583, 1955. 5. Stuteville, O. H., **et al.**: Am. J. Surg. **96**:787, 1958.

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NOTICE TO ALL PHYSICIANS RE RECENT CHANGES IN THE UNIFORM STATE NARCOTIC DRUG ACT*

I. Effective October 1st, 1963: Section 19-252. Record to be kept. (1) Each physician, dentist, veterinarian or other person who is authorized to administer or professionally use narcotic drugs shall keep a record of all such drugs administered, dispensed or professionally used by him otherwise than by prescription.

A notation on the patient's medication record card or a suitable note book as to the kind and quantity of drugs and the date these drugs were administered or dispensed, will be sufficient. Effective October 1, 1963 P.A. 356

II. Effective April 15th, 1964: Section 19-263. Retail Sales of Class "X" preparations without a written or oral prescription by a licensed practitioner who is authorized by law to practice in this state and to use narcotic drugs in practice, are prohibited, except—

(1) not more than eight fluid ounces of any preparation which contains camphorated tincture of opium or the opium equivalent of it not to exceed 16.2 mg of opium per ounce and from which the camphorated tincture of opium or the opium equivalent cannot be easily extracted;
(2) not more than four fluid ounces of Brown Mixture;
(3) not more than four fluid ounces of Stokes Expectorant;
(4) not more than one-half fluid ounce of camphorated tincture of opium.

It will be necessary for the physician to give an oral or written prescription for any exempt preparation containing codeine, dihydrocodeine, dionin or morphine. It will also be necessary for the doctor to stipulate on the prescription, the number of times the patient may have this medicine refilled. P.R.N. or ad lib orders will not be recognized.

It is recommended that physicians familiarize themselves with the report of the American Medical Association Council on Mental Health, Academy of Sciences, National Research, etc., which was printed in the J.A.M.A., September 21st, 1963, page 156, concerning the physician's use of narcotic drugs in medical practice and the medical management of narcotic addiction.

III. Effective October 1, 1963: An Act Concerning the Giving of a Non-Narcotic Drug When a Narcotic Drug Has Been Ordered By a Physician.

The sale, barter, exchange, giving, administration or dispensing as a narcotic drug of any liquid or substance not a narcotic drug, when not authorized by the registered physician, shall be deemed to be a violation of chapter 344 of the general statutes.

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* This summary was prepared and submitted by Robert C. Grieb, Chief, Narcotics Control Section, Connecticut State Department of Health.

PUBLIC HEALTH CODE REGULATIONS TO IMPLEMENT PUBLIC ACT 623, 1963

"Registration Of X-ray Devices Used For Diagnosis And Therapy"

Sec. 19-13-E14 (a). Subdivision (a) of Section 19-13-E14 of the regulations of Connecticut state agencies is repealed.

Sec. 19-13-E25. Registration requirements.

(a) The owner of a device or devices emitting X-rays which are used for diagnostic or therapeutic purposes by or under the supervision of a person or persons licensed to practice medicine, surgery, osteopathy, chiropractic, natureopathy, dentistry, chiropody or veterinary medicine and surgery, as authorized by law shall register such device or devices with the state department of health. Such registration shall be on forms provided for the purpose by the state department of health and shall contain the information required by the commissioner of health. Owner shall mean a person or organization having by law the administrative control of the X-ray device or devices.

(b) No X-ray device shall be used after May 1, 1964, unless registered with the state department of health if in current use or, if a newly acquired X-ray device, before it is place into operation.

Sec. 19-13-E26. Requirements for renewal of registration.

The owner of a device or devices emitting X-rays which are used for diagnostic or therapeutic purposes by or under the supervision of a person or persons licensed to practice medicine, surgery, osteopathy, chiropractic, natureopathy, dentistry, chiropody or veterinary medicine and surgery, as authorized by law shall renew the registration of such device or devices biennially during the month of April in the even-numbered years.

Sec. 19-13-E27. Registration fee. State-owned devices exempted.

(a) The registrant shall pay a registration fee at the time of registration. The registration fee at each location shall be fifteen dollars for one X-ray device, five dollars for the second, and one dollar for each additional X-ray device registered by one owner. X-ray devices owned by the state shall be registered but shall be exempt from payment of fee.

(b) (All new) Registrants of an X-ray device or devices newly acquired after May 1, 1964, shall pay a registration fee prorated on a monthly basis from the first day of the month when said device or devices are put into use until April 1 in the even-numbered year next following, after which registrants shall renew their registration on a biennial basis and pay the registration fee herein setforth.

Sec. 19-13-E28. Compliance with public health code mandatory.

Registrants shall comply with section 19-13-E15, subdivisions (a) (b) (c) (d) (f) (g) (h); section 19-13-E16, subdivision (b); and section 19-13-E17, subdivisions (a) (c), of the state public health code pertaining to control of radiation hazards, and registration may be suspended or revoked for failure to comply. Operation of an unregistered X-ray device or one which does not meet the requirements of the public health code shall constitute a violation of that code.

Sec. 19-13-E29. State-aided hospitals exempted.
State-aided hospitals shall be exempt from the provisions of section 19-13-E25, section 19-13-E26, and section 19-13-E27.

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* *Information furnished by Franklin M. Foote, M.D., Commissioner, State Health Department, Hartford, Conn.*

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